Chemical Industries Week

February 3, 1951

Formaldehyde shortage—major hurdle in path of potentially huge wood waste industry . p. 8

New chlorine output captive as plant cost soars . . . . . p. 10

Lower cost grain alcohol in prospect; new enzyme replaces malt in fermentation . . . . p. 19

CIW Camera follows development of new aerosol air freshener at Bostwick Labs . . . . . p. 22

Plant security expert warns industry: saboteurs are chief danger in future war . . . . p. 31

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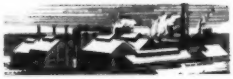

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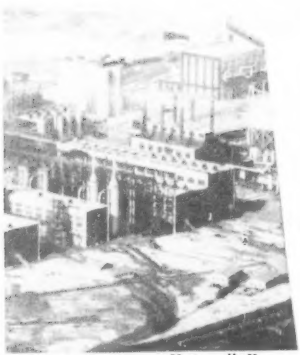

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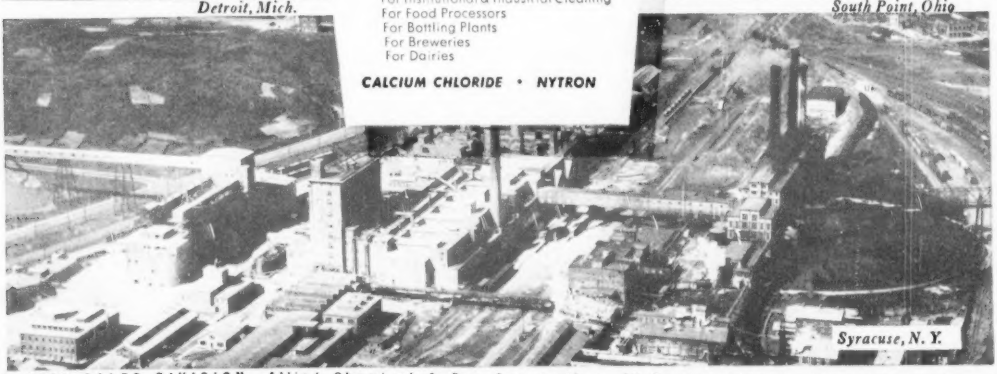

Syracuse, N. Y.

SOLVAY SALES DIVISION, Allied Chemical & Dye Corporation, 40 Rector Street, New York 6, N. Y.

Chemical Industries Week

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Chemical Industries Week (including Chemical Specialties) is indexed regularly by Engineering Index, Inc., and Industrial Arts Index.

Publisher: W. F. Traendly; Editorial Director: S. D. Kirkpatrick; Editor: W. Alec Jordan.

Publication Staff: Executive Editor, Richard L. Demmerle; Managing Editor, Howard C. E. Johnson, Associate Editors, Herman W. Zabel, John J. Craig; Assistant Editors, Ralph R. Schulz, Joseph Gordon; Editorial Assistants, Donald P. Burke, Theresa Haas, Leona Mahler; Editorial Make up, Woodin G. Mizell, Jr.; Consulting Editors: Lawrence W. Bass, Benjamin T. Brooks, J. V. N. Dorr, Charles R. Downs, Ernest W. Reid, Norman A. Shepard, Roland P. Soule, Robert L. Taylor. Business Staff: Sales Manager, B. E. Sawyer; Business Manager, A. E. Weis; New York, Knox Armstrong, Charles Todaro, Robert S. Muller; Philadelphia, Wm. B. Hannum, Jr.; Cleveland, V. K. Dissette; Chicago, A. D. Becker, Jr., Frank C. Mahnke, Jr.; Atlanta, Ralph Maultsby; Dallas, J. H. Allen; Los Angeles, Carl Dysinger; San Francisco, John Otterson.

Published weekly by McGraw-Hill Publishing Company, Inc., James H. McGraw (1860-1948), Founder. **Publication Office: 1309 Noble St., Philadelphia 23, Pa.**

Executive, Editorial and Advertising Offices: McGraw-Hill Building, 330 W. 42nd St., New York 18, N.Y. Curtis W. McGraw, President; Willard Chevalier, Executive Vice-President; Joseph A. Gerardi, Vice-President and Treasurer; John J. Cooke, Secretary; Paul Montgomery, Senior Vice-President, Publications Division; Ralph B. Smith, Editorial Director; Nelson Bond, Vice-President and Director of Advertising; J. E. Blackburn, Jr., Vice-President and Director of Circulation.

Subscriptions to Chemical Industries Week are solicited in the chemical and process industries only from management men responsible for corporate affairs, purchasing, sales, marketing, packaging, research or chemical functions. Position and company connection must be indicated on subscription order. Address all communications to J. E. Blackburn, Jr., Director of Circulation, 330 W. 42nd St., New York 18, N.Y. Allow ten days for change of address.

Single copies 35¢. Subscription rates—United States and Possessions $5.00 a year; $8.00 for two years; $10.00 for three years. Canada $6.00 a year; $10.00 for two years; $12.00 for three years. Pan American countries $7.00 a year; $11.00 for two years; $14.00 for three years. All other countries $15.00 a year; $25.00 for two years; $30.00 for three years. Entered as second class matter July 15, 1944, at the Post Office at Philadelphia 23, Pa., under the Act of March 3, 1879. Printed in U.S.A. Copyright 1951 by McGraw-Hill Publishing Co., Inc.—All Rights Reserved.

Branch Offices: 520 North Michigan Ave., Chicago 11; 68 Post St., San Francisco 4; Aldwych House, Aldwych, London W.C. 2; National Press Bldg., Washington 4; Philadelphia 3; Cleveland 15; Detroit 26; St. Louis 8; Boston 16; Los Angeles 17; Atlanta 3; Pittsburgh 22; Houston 2.

OPINION . . . . . .

Patent Digests

To the Editor: The first number of the new magazine was eagerly awaited. While it is too early to form an intelligent opinion as to its merits, I miss one feature which I prized highly in the old Chemical Industries because it gave me clues as to real or potential new developments. I refer to the abstracts of patents.

The service performed by CI in giving an extensive list of abstracts of interest to the process industries was worth its cost many times over in not having to wade through the Official Gazette.

There is, I believe, a distinct need for such a service. To my knowledge, there is no publication available to do this promptly and comprehensively. Chemical Abstracts are too slow and other lists too restricted.

I would like to make the suggestion that you reconsider this matter.

Adolph Zimmerli
New Brunswick, New Jersey

CIW appreciates Reader Zimmerli's comments, is reconsidering the matter. Our current feeling, however, is that it is better for CIW's editors to peruse the patents, report on those of significance only . . . Ed.

Pot Carb, Of Course

To the Editor: Yesterday's mail brought in the first issue of Chemical Industries Week in its new format. Personally, I think this first issue holds an interesting promise for future issues . . .

I have one minor comment on a possible misconception some readers will get from the final item in the Newsletter section of the magazine. The paragraph says that potash producers are keeping an eye on the television industry and fretting about curbs in television tube production, the reason being that "a quarter of the potash made in the U. S. goes into the glass used for the 'big bottle' in television receivers."

"Potash" is used in the industry as a term for muriate of potash, whether of agricultural or chemical grade. Glass manufacturers do not use potassium chloride in their formulations, their need being for potassium carbonate. It may be true that a quarter of potassium carbonate now being manufactured in the U. S. goes into glass compositions for television tubes, but it is rather far from the mark to say that a quarter of the potash is utilized in this way, for a quarter of the U. S. potash production would be more than the total weight of the glass itself in television tubes, radio receiving tubes, as well as a substantial portion of the glass in ordinary lamp bulbs.

Any of your readers familiar with television tube glass compositions will, of course, make the mental conversion of potash to potassium carbonate, but there may be other readers, who think of muriate of potash as "potash," who will become a little confused by the statement.

A. E. Marshall
Providence, Rhode Island

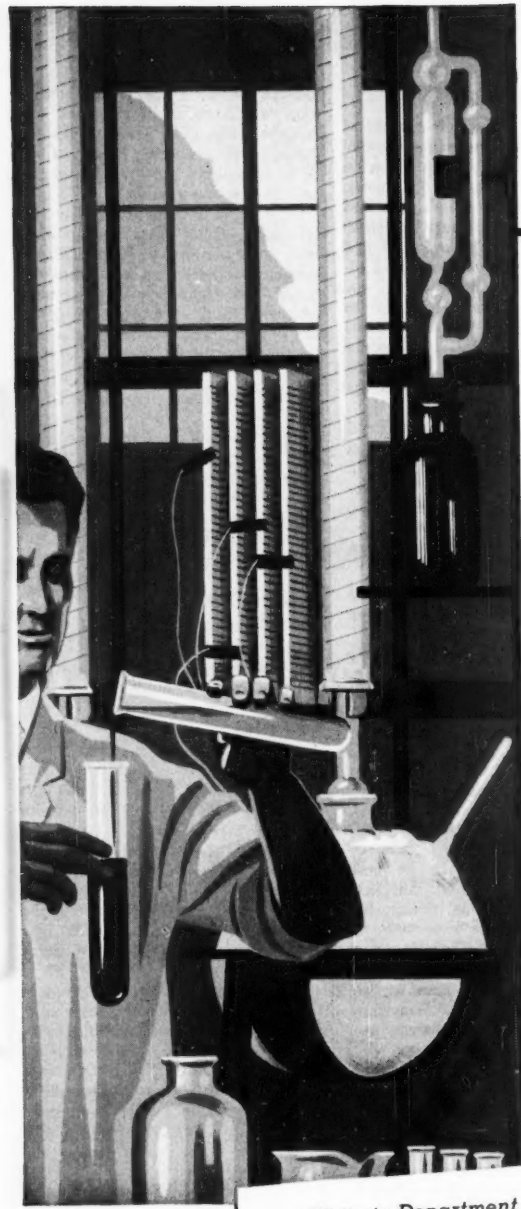
Reader Marshall (and 16 other eagle-eyed subscribers who took CIW to task) have a point. Using "potash" rather loosely we did not err, in the light of glassmakers' usage of the term and Webster's Unabridged; but we did bumble . . . Ed.

Sulfur Outlook

To the Editor: Your review of the sulfur situation in the November issue under the heading "Sulfur Lament" covers the subject very well. The announcement, by the sulfur producers that shipments to foreign customers would probably have to stop and that delivery to domestic users would have to be curtailed came as a severe jolt to the acid industry—more so in fact than the recent announcement of a price increase. It came at a time when the demand for sulfuric was greater than it had ever been; when manufacturers already in the field were planning to expand their facilities and newcomers were about to enter it.

The effect of these announcements is already widely felt both here and abroad and acid producers are looking for other sources of raw material. Unfortunately for them, their plants are not designed for the use of sulfide ores, gypsum and other low-grade sulfur-bearing materials and the change-over will be costly. It is certain to influence the design of any new plants in prospect, especially if the allocation of sulfur is curtailed still more or if there is a further rise in the price of sulfur. It will have a very decided effect in the oil refining and steel manufacturing industries, where great quantities of sulfuric acid are consumed. These industries may soon find it necessary to recover the acid from waste products since recovery processes are already available.

Your article touched briefly on the subject of low-grade ores containing



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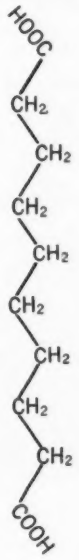

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41 East Forty-second St., New York 17, N.Y.

elemental sulfur but not adaptable for mining by the Frasch process. Deposits of this kind have been worked for years in countries where labor costs are low, but the crude methods used and the poor yields obtained have prevented such deposits from being fully utilized. It might interest your readers to learn that progress has recently been made in perfecting a process involving continuous autoclaving, flotation, melting and filtering that produces, from low-grade ores containing 30% to 50% sulfur, a product that is 99.5% pure and suitable for use in the modern contact sulfuric acid plant. With highly modernized mechanical equipment, the cost of recovering the sulfur is not very high and makes the product competitive in price with Frasch-mined sulfur, especially in locations where high freight costs on Texas and Louisiana sulfur obtain.

The development of this process will not affect the sulfur sales materially in the Texas-Louisiana field since the demand there exceeds the supply. It will undoubtedly help the Northwest where the high freight costs on Texas sulfur have retarded the expansion of the chemical industry. If the process can be applied successfully on the vast known deposits in foreign countries, this country will be relieved of much of its sulfur export. demand thereby conserving this valuable product for our own use.

F. J. Bartholomew
New York, New York

Chemicals in Foods

To the Editor: I certainly enjoyed your recent editorial entitled *"Congress Eyes Chemicals."*

It is gratifying to know that the McGraw-Hill publications have given good coverage to this pertinent situation.

H. E. Whitmore
Universal Oil Products Co.
Chicago, Ill.

A vital subject; more on recent developments soon.—Ed.

Packaged SO_2

To the Editor: I noticed your article on packaged sulfur dioxide in a recent issue of Chemical Industries Newsletter. This product was originally conceived and developed by Eston Chemicals, Inc., under the trade name Charg-A-Can, and was introduced at the All Industry Refrigeration Show in Atlantic City in November of 1949, at which time it was one of the outstanding developments in the refrigeration industry.

Originally "Freon-12" and "Freon-114" were packed in the Charg-A-Can, and in April of 1950 we started shipping sulfur dioxide in the Charg-A-Can, and it is now in the hands of refrigeration wholesalers and maintenance men throughout the United States. The entire idea of a packaged refrigerant in the 16 ounce can was conceived and developed by Eston Chemicals, and the container was also developed by Eston and is being manufactured by Crown Can Company on its specification.

G. S. Wheaton
Vice President
Eston Chemicals, Inc.
Los Angeles, California

We are glad to print Reader Wheaton's comments. CIW simply reported that another company, also prominent in the refrigeration supply field, was launching a 16 ounce sulfur dioxide container equipped with a re-usable clip-on valve. It was neither said nor suggested that this was the first such container developed.—Ed.

Citric Surge

To the Editor: I read with considerable interest the January 20th issue of Chemical Industries Week, particularly the article entitled "Citric Surge."

This is very well written and presented in a very fine manner.

I am sure you would want to know that many of my friends in the industry, as well as my associates, have commented favorably on this article.

John E. McKeen
President
Charles Pfizer & Company, Inc.
Brooklyn, New York

CIW's thanks to Reader McKeen, the country's top citric authority . . . Ed.

Liquid Detergents

To the Editor: I was particularly interested in your Newsletter comments (Jan. 20) on the attention being paid to liquid detergents. . . .

Various manufacturers have investigated such products . . . and it appears that lack of consumer advertising support has been the main deterrent to wide use rather than any difficulty in production or packaging.

. . . Potentially, they represent huge tonnage. . . .

John W. McCutcheon
New York City

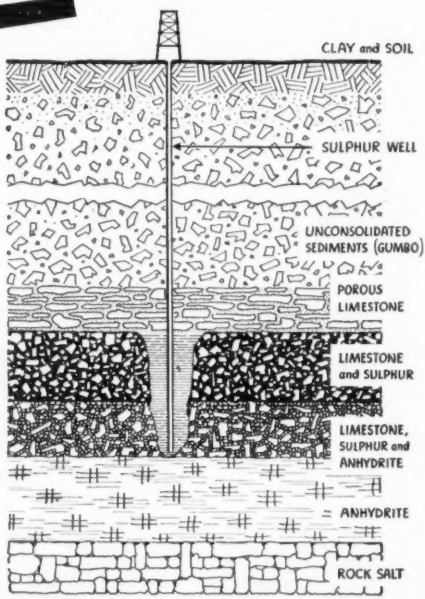
SULPHUR

*Interesting Facts Concerning This Basic Raw Material from the Gulf Coast Region

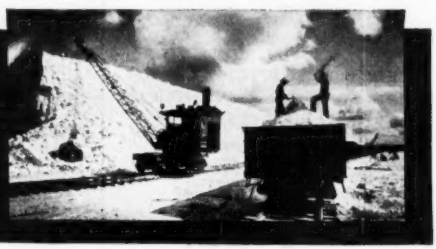
*DEPOSITS . . .

Practically all of the elemental sulphur used in this country comes from mines in Louisiana and Texas.

There, the sulphur deposits occur in the cap rock overlying certain salt domes. The sulphur is mined at depths of 300 to 2,000 feet below the surface. It is melted in place by pumping into the deposit water heated under pressure to a temperature above the melting point of sulphur. The melted sulphur flows away from the limestone and is pumped to the surface where it is allowed to solidify in vats. By such means sulphur nearly 100% pure is produced.



Loading operations at our Newgulf, Texas' mine



TEXAS GULF SULPHUR CO. INC.

75 East 45th St. New York 17, N. Y.

Mines: Newgulf and Moss Bluff, Texas

Chemical Industries Week

BUSINESS MAGAZINE OF THE CHEMICAL PROCESS INDUSTRIES

NEWSLETTER

Expect to hear more about a new process to beat the sulfur shortage. Chemical Construction Corp. can recover elemental acid-grade sulfur from surface deposits (U. S. Patent No. 2,537,842). Best news: With deposits containing over 20% sulfur, the product can reportedly be marketed at current price levels.

Process consists of grinding native sulfur-bearing ore, suspending in water, heating above the melting point of sulfur to coalesce the fine particles, cooling, and subjecting the final mix to froth flotation. Sulfur is floated off with the froth, and filtration yields the product ready for acid manufacture. A $1.5 million plant utilizing the process is now under construction in Columbia.

Thermal nitrogen fixation process will soon move out of the pilot-plant stage: The government has allocated $2 million for a 40-ton-a-day nitric acid plant based on the process licensed by the University of Wisconsin to Food Machinery & Chemical Corp. for commercial development and exploitation.

Process consists of oxidizing nitrogen to nitric oxide in a furnace. Upon cooling the oxide is further oxidized to nitrogen tetroxide which dissolves in water to give nitric acid.

McCarthy Chemical Co's plant is now being surveyed by company—as yet undisclosed—which will lease or buy it. Modification will be necessary to make process workable, and survey will also determine whether same or other chemicals will be made. New president, accountant R. M. Riggins, has backing of Metropolitan Life Insurance Co., heavy investor in McCarthy's enterprises.

Celanese Corp.'s ChCemical Division has started turning out 1,3-butylene glycol in commercial quantities, and large-scale production of 2,3-butylene glycol has been put on a continuing basis.

Food Machinery & Chemical Corp. hopes to get a certificate of necessity for a plant to purify soda ash from the Green River, Wyo., mine now operated by its Westvaco Chemical Division. Purification process was decided upon as a more economic alternative to installation of a standard Solvay process plant.

First Canadian production of anhydrous aluminum chloride will start this month. Aluminum Co. of Canada, Ltd., will produce enough to take care of Canadian demand. Considerable market for the product exists, but import supplies are short.

Yosemite Chemical Co. (San Francisco) is distributing a new insecticide, Dispercide, in its immediate area. A dry aerosol bomb, the cardboard package contains a mixture of chemicals that evolve propellent gases when they are caused to react, dispersing the active ingredients (20% DDT, 5% chlordane). Product is residual, is aimed at warehouses, stables, etc. National distribution is planned.

Price control of chemicals will run into at least two puzzlers: First is new products—items that weren't made last month and for which there is no basis for price rollback. An example of the second—rising production costs— is the 15¢ raise which Sherwin-Williams gave 1,300 CIO chemical workers in settlement last Sunday of the 20-day strike at its Chicago plant.

Requests for ECA aid point to further pressure on domestic chemical supplies. Pending before the Economic Cooperation Administration are applications from five European countries for procurement authorizations covering more than $4 million worth of chemicals, chemical preparations and pharmaceuticals.

Items sought: by Germany, $1.3 million worth of glycerin, menthol, and other chemicals; by Turkey, $1.1 million of antibiotics and insecticides; by Greece, $400,000 worth of medicinal and pharmaceutical preparations; by Italy and Sweden, $1 million and $500,000 worth, respectively, of various chemicals.

World nitrogen output will be boosted by an ECA-financed plant in Reykjavik, Iceland, to produce nitrogenous fertilizers. Approval has been obtained for a proposal to make 6,000 metric tons a year of ammonia, the hydrogen to be obtained by electrolysis of water and the nitrogen from fractionation of liquid air.

Steel drum and wood barrel reconditioning is held up by lack of caustic soda and phenolic resins, industry officials told the National Production Authority last week. Caustic is used for cleaning and resin for inside and outside coating.

The industry seeks: assurance of enough materials for reconditioning; return of exported drums; importation of products packed in steel drums and wood barrels. NPA has set up a four-man task group to study problems and give advice.

Hercules Powder Co. has tagged $16 million for expansion this year—but realization of plans depends on availability of raw materials. Vital character of products points to issuance of the required certificates of necessity.

By March Hercules' toxaphene capacity will equal all U. S. capacity for DDT. The company also plans to boost carboxymethyl cellulose capacity by 50%.

More aluminum is on the way from Kaiser Aluminum & Chemical Corp.'s reduction plants at Spokane and Tacoma. Recent expansion at Tacoma upped capacity to 50 million pounds a year, and a 16% boost at Spokane was completed in January, raising its capacity to about 290 million pounds annually.

Power shortage in the Pacific Northwest makes it likely that additional reduction plants will be built in the Gulf Coast area, where gas is available.

Hooker Electrochemical Co. paid twice as much in taxes during its fiscal 1950 (ending November 30) as in the preceding year—$3.3 million vs. $1.6 million —and still showed a net profit of $3,770,300 against 1949's $2,560,800.

Here and There:

Ductile zirconium is finding a niche in atomic development. Foote Mineral Co. (Philadelphia) is supplying considerable amounts to the Atomic Energy Commission for development of atomic power plants. Zirconium's unique advantage: It is relatively inert to bombardment by neutrons.

Fluorination of water supplies to fight tooth decay is catching on in more and more municipalities: Indiana State Dental Association has indorsed addition of fluorides by Indiana towns under supervision of state medical authorities; the Philadelphia city council is studying a proposal to spend $100,000 for fluorinating equipment and supplies.

. . . The Editors

Here's the dope on 2 "KARBATE" IMPERVIOUS GRAPHITE HEAT EXCHANGERS

The new No. 240A is a shell-and-tube heat-exchanger made of "Karbate" brand impervious graphite . . . similar in construction to the familiar No. 70A . . . but with almost three times as much total effective external heat transfer surface. Advantages are:

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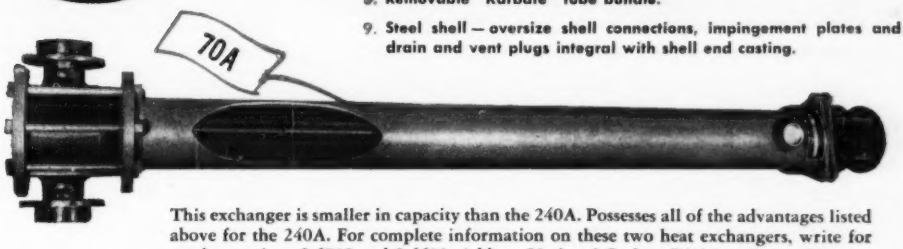

This exchanger is smaller in capacity than the 240A. Possesses all of the advantages listed above for the 240A. For complete information on these two heat exchangers, write for catalog sections S-6715 and S-6690. Address National Carbon Division, Dept. CI.

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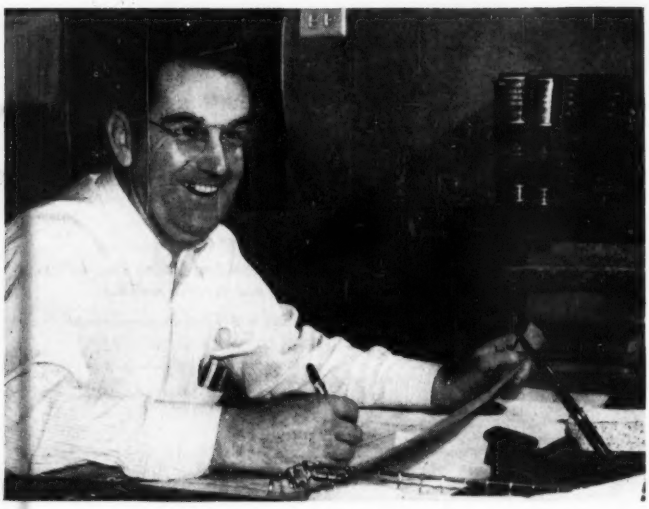
WHAT'S NEW . . . . . .



CHEMIST CAUGHEY: He found the right resin to bond the wood.

Cashing the Chips

U. S. Plywood Corp., latest manufacturer of wood-resin boards, starts production this week at its big (50 million feet per year), new Anderson, Cal., plant.

Products, which utilize waste wood, compete favorably with conventional lumber, and represent a market for millions of pounds of formaldehyde, urea, melamine, and phenol. . . . .

But current shortage of these vital chemicals is a major obstacle to further large-scale expansion of the neophyte industry.

Which must either snare its share of mobilization production, or abandon hope of increasing raw material supply.

More than half of every tree that goes into the lumber mill comes out in a pile of chips, sawdust, and shavings. Several million trees go into lumber mills annually; an awful lot of sawdust comes out. Most of it goes up in smoke.

With an eye on our rapidly diminishing forests, wood technologists have long searched for a way to remedy this deplorable waste. Binding these wastes into a composition wood material which could be marketed as a companion product to lumber was the most attractive prospect – but easier said than done. It had been tried off-and-on over a stretch of forty years with very little success, although each attempt added a drop to the reservoir of technical know-how.

New Hampshire chemist Robert Caughey's contribution turned the trick for a resourceful mill operator, and today an infant wood waste-bonding industry is very much alive and kicking. Ample evidence is the hundreds of thousands of feet of resin-bonded board turned out weekly by a rapidly growing list of manufacturers. Latest on the bandwagon is the U. S. Plywood Corp. with a big, new (production started Feb. 1) plant at Anderson, Cal.

Products made of wood scraps and various resins find use in many profitable applications. Most important is the board which can be worked into different shapes. Easily sanded, sawed, and planed, it takes nails and screws and can be painted or varnished. It is strong, light, and has good warp-resistance.

Big markets for the product are furniture core stock, table tops, curved chair backs, shelving, and paneling. High strength, insulating ability superior to that of wood, and good warp-resistance make the new board ideal for doors, wall panels, and flooring. Demand in building construction (potentially the best customer) is holding off until production can keep pace with mammoth requirements.

Core for plywood is another healthy outlet. More resilient than wood, the material also makes an excellent linoleum base and serves well as a center for rubber belting.

Best of all, bonded wood products sell for about two thirds the price of lumber needed for the same job.

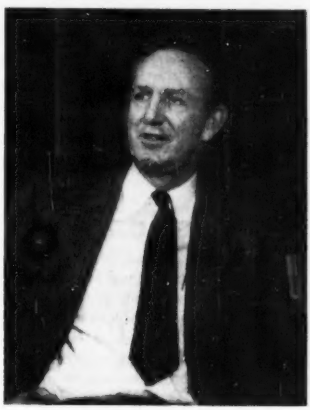
First large-scale domestic product was developed at Souhegan Mills, Wilton, N. H. During World War II, when the mill was turning out ammunition boxes, owner Randall Myer and wood-technologist Robert Caughey saw lost profits in the tons of waste piling up as mill scraps. Two thousand board feet of finished lumber was daily written off to the scrap heap.

Resolved to do something about the situation, Myer set up a laboratory in his plant and chemist Caughey moved in. Objective: a salable, resin-bonded product to utilize mill by-products.

Right from the start, main headache seemed to be the resin. It had to

produce a strong bond at a price geared to the lumber market. Urea-formaldehyde looked good, but results varied from trial to trial. Eventually it became clear that it was not always the fault of the resin. Wood particle size was an important factor as well as the nature of the actual bonding operation.

In short, success depends upon a happy marriage of the resin and a well-dimensioned wood chip. Contrary to early belief, sawdust alone does not fill the bill. Far better are ½"-long needle-tipped wood shreds (which may be mixed with sawdust). They require less resin and can be



OWNER MYER: He lost an unprofitable scrap-pile.

used to make thicker boards.

Just when things were looking bright for the Souhegan pioneers, the mill burned—lock, stock, and barrel. Fortified with the key to a workable process and a liberal dose of optimism, Randy Myer rebuilt and installed experimental equipment to launch his new productive venture. Wheels turned; wood shreds, urea, and formaldehyde went into the works; a solid substantial product emerged. Souhegan was in business.

First use for the new material was cores for rubber belting. Order followed order, providing much-needed capital that was not forthcoming from banks and government agencies. New markets appeared; process improvements followed suit. Phenolic and melamine resins made the material water-resistant and suitable for exterior use.

Special grinding equipment was developed, and big board-making hydraulic presses were installed. Subsequently demand soared, and the composite board soon became familiar to lumber yard operators.

Today, Souhegan produces for H. I. Hymans' Plaswood Corp. (Detroit), which blazed the frontier of commercial development. Under the aegis of business-wise Hymans (38 years in lumber), the board, called Plaswood, is manufactured by Souhegan and Plaswood licensed mills at Hope, Ark., and New Brunswick, Canada.*

Expansion is a knotty problem for Plaswood. Aside from capital considerations, it faces a raw material crisis. The squeeze is on urea, phenol, and formaldehyde; relief is nowhere in sight. Urea from Du Pont and Solvay has been supplemented from time to time with shipments from Germany and other foreign sources. The imported chemical does the job, despite variations in quality from batch to batch.

Formaldehyde is probably in the most ticklish predicament. Souhegan alone takes enough from Celanese to make an estimated 25,000 lbs. of resin per week, and Southern Plaswood (Hope, Ark.) consumes more. While Celanese says it can fill the order at the present allocation rates, increases will be dependent on Plaswood getting a share of defense production.

Plaswood facilities can turn out 140,000 board feet a day. President Hymans estimates the potential market at 2 million feet-a-day, and maybe more. The elbow room is partly taken up by other producers (Curtiss Industries, Plywood-Plastics Corp., etc.).

But the whole picture takes on a new light this week, with the opening of U. S. Plywood's California plant. Its product, Novoply, has been produced in Europe since 1947, but never in the U. S.

This sizable new manufacturing facility underscores the importance of the infant industry as a substantial chemical market. Formalin requirements are estimated at 60 million lbs. for 1951 and triple this figure in five years. Manufacturers of the essential chemicals (especially formaldehyde), already hard put to keep up with staggering demand, hope they can supply it.

High Analysis Up

Production capacity for concentrated superphosphates is expected to increase from the present 750,000 tons per year to about 900,000 tons per year when present construction projects are completed. Whether production will keep pace with this capacity expansion is in the hands of Mars.

Production of the concentrated material, except as carried out by TVA, requires much more sulfuric acid than preparation of ordinary low-analysis superphosphate. Thus the present sulfur shortage could be a stumbling block if military demands should necessitate its use for some other purpose.

From phosphorus: TVA does not use sulfuric acid. Its concentrated product is obtained by the action of phosphoric acid from electric furnace-produced elemental phosphorus, instead of using phosphoric acid obtained by reacting phosphate rock with sulfuric acid. But TVA's production is even more vulnerable to war demands. Military operations require

MAURICE H. LOCKWOOD: Accent on freight.

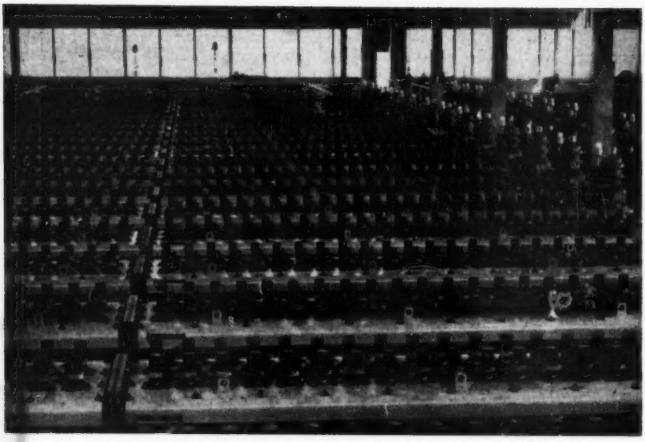
large tonnages of elemental phosphorus for incendiaries.

Too, TVA's production, some 150,000 tons per year, was in for a cutback a few months ago. Its plant for concentrated superphosphate was operated as a demonstration unit and this work was considered complete. However, the present national emergency, with the attendant high demands for phosphate fertilizers, caused this plan to be ditched—that is, as long as the phosphorus is not needed for military purposes.

High transportation costs are one of the major reasons for the increasing popularity of the high-analysis phosphates, according to Maurice H. Lockwood of International Minerals & Chemical Corp. Freight rates on fertilizer materials have increased some 70%-80% in the last decade. The saving in freight on the concentrated material is obvious when it is realized that this product has 250% more usable phosphate in each pound.

According to Lockwood, production of a million tons of concentrated superphosphate per year is quite likely within the near future.

* Others at Grand Rapids, Mich., Rock Island, Ill., Klamath Falls, Ore., Kansas City, Mo.



MERCURY CELLS: A lot of them are being taken into captivity.

Captive Chlorine

Chlorine production has gone captive. Low sales prices and rising plant costs are squeezing profits and scaring investors.

The present price of a new chlorine plant is over $100,000 per ton-day of chlorine produced.

More small units can be expected, even at this price, as consumers seek a more secure supply.

This kind of money can be found only if chances for a reasonable profit can be improved by conversion of chlorine by the producer into a more valuable product; if the chlorine is required to keep a much larger plant in operation, as in a paper mill; or if a chlorine user will assure a reasonable profit under a long-term contract. In any case such new capacity is captive production.

Despite this problem, production continues to expand at an increasingly rapid rate. CIW estimates that the chlorine plants which are now under construction will cost over $150 million, equivalent to about 1,450 tons per day. Current production capacity is now over 6,000 tons per day, which represents a doubling and redoubling since 1940.

Never enough: Although chlorine production has continued to burgeon since the beginning of World War II, demand has more than kept pace with the plant expansion.

This is not true for caustic soda, chlorine's co-product. At the moment caustic supplies are depleted by the demand for an alkali of almost any type at almost any price as a result of the long strike in the soda ash plants of Solvay Process Div. of Allied Chemical & Dye Corp. and the Diamond Alkali Co. But this imbalance will soon be restored.

Caustic changes: The imbalance in caustic supplies plus the increasing cost of producing caustic by liming soda ash have produced a number of changes in the source of caustic soda for viscose rayon manufacture. With the exception of a small amount of mercury-cell caustic, viscose producers until recent years have relied on lime-soda caustic to provide material of the required high purity. The large amount of electrolytic caustic made available by rapidly expanding chlorine production has spurred installation of diaphragm-cell purification units and increased the proportion of mercury cells in plants now under construction.

More small units: In some ways chlorine producers are in much the same position as sulfuric acid manufacturers at the end of World War I. At that time most sulfuric acid was marketed by sulfuric acid producers. The introduction of the relatively inexpensive catalytic acid plants greatly reduced the portion of the acid sold and increased the amount of acid produced at the consumer's plant.

In spite of the extremely high cost of chlorine plants, a rather tricky operation, and the problems associated with the disposal of two concurrent products, a number of small chlorine plants are now being installed. Two paper companies in the United States and one in Canada and one chemical company are now installing chlorine plants to meet their needs. Of perhaps greater importance is the relatively large number of paper and chemical producers who are giving very serious consideration to the installation of similar plants. One company, for example, has had a chlorine-using facility completed for some time but, as yet, lack of chlorine has prevented its operation.

Needed: A simple relatively low-cost small-scale package chlorine plant.

No Solution

The well-advertised benzene shortage and a large demand for synthetic rubber have caused many to raise the question: If cost problems could be overcome, could GR-A, a butadiene-acrylonitrile copolymer, substitute for GR-S, the butadiene-styrene copolymer which is now the backbone of the synthetic rubber industry? Supply of raw materials for production of acrylonitrile via the acetylene route (*CI, Dec. 1950, p. 875*) are relatively unlimited, and substitution of acrylonitrile for styrene could conceivably solve the benzene problem.

Probably not: To this question those who know rubber best answer, probably not. One, however, prefaced his answer with the comment, "Every time you say something can't be done, someone else makes a fool of you by doing it."

The relative quantities of styrene and acrylonitrile used in each type are about the same. Thus, to compete acrylonitrile prices would have to be even lower than an unlikely 20¢ per pound unless some other outstanding advantage could develop. Acrylonitrile now sells for 38¢ per pound.

Acrylonitrile-containing rubbers are now being used primarily because of their excellent resistance to hydrocarbon oils. But this advantage is not sufficient to offset their stiffness, which makes them very difficult to process. In the Germans' experimentation with GR-A type rubbers, it was necessary to use an oven-type oxidation to make the rubber processable.

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Bulk for Bullets

An enterprising young company is carving its chemical future with a superior photographic hypo that does twice the work of conventional products three times as fast. Important directorship additions emphasize the firm's solid foundation and forecast a bright future.

But true to the temper of the times, Uncle Sam will have a lot to say about the days ahead. If dynamic president Harold E. Ingraham and Cliff Hemphill, Jr., enthusiastic v. p., can get their Heico, Inc. into mobilization production, the problem of securing enough caustic soda, soda ash, sulfur, ammonia, etc., to make sodium ammonium thiosulfate-hypo will be considerably easier.

The government would not be caught short on such a deal, for Heico has more to offer than good intentions.

Its extra-efficient SAT* photographic fixer is three times as fast as ordinary sodium thiosulfate, ten-fold more soluble, stable at high temperatures, and—best of all—twice as efficient. In other words, 1 lb. of SAT will do the work of 2 lbs. of ordinary hypo in ⅓ the time for about the same cost.

Significance of these virtues is apparent to any one concerned with shipping and storage. Not only are cargo costs cut in half, but, perhaps more important to the military, cargo bulk enjoys the same benefit. Transportation space saved yearly on almost 50 million lbs. of photographic hypo can be used for more essential wartime material. It's trading bulk for bullets.

Credit for this "better mousetrap" goes to chemist Harold Ingraham, chief technical talent and guiding spirit of Heico, Inc. This is a well earned laurel for University of Penn. and Drexel-educated Ingraham who has been a familiar figure in the photochemicals industry since his departure from General Chemical Division (Allied Chemical and Dye Corporation) in 1941. Striking out for himself, young Ingraham organized his own Ingraham Research Laboratories to make an ammonium thiosulfate photo fixer called "NH5 Hypo Concentrate."

In time, Ingraham started up another firm known as Heico. Through the latter organization he did custom darkroom installations, concentrating on testing units and specialized darkroom equipment. Satisfied customers ranging from Bethlehem Steel to *The Saturday Evening Post* helped keep the wolf away and paved the way for bigger and better things to come.

New era dawned in February, 1949 when Hal Ingraham teamed up with Cliff Hemphill, Jr., to form Heico, Inc., which took over total assets of the old Heico and Ingraham Research.

From headquarters in Stroudsburg, Penn., the new outfit turns out Distol-8 (*CI Newsletter, July, '50*), a water-soluble liquid ion-exchanger having good coupling properties, used in the dairy, electro-plating, photographic, and textile industries. Another product is the Heico X-ray Film Dryer, sold by such industry-wise outfits as General Electric, Kelley-Koett, and Westinghouse.

But the place of honor is occupied by SAT (*CI Newsletter, Oct. '50*), companion to the NH5 ammonium hypo and protected by recently issued U.S. Patent 2,475,616. SAT combines the best features of sodium and ammonium thiosulfate hypos with a few of its own. In addition to its speed and efficiency, it dissolves easier, washes out of prints faster, and facilitates silver recovery either by the electrolytic or sulfide methods. Cost is comparable to ordinary fixers.

Selling SAT is no problem. Thanks to Cliff Hemphill's sales-sense, the product has come a long way up the market ladder in its short commercial life. Today, SAT is the star to which Heico's fortunes are hitched. Justification for this faith comes in the form of important additions to Heico, Inc.'s board of directors. This week Clifford Hemphill, Sr. (of Wall St.'s Hemphill, Noyes, Graham, Parsons & Co.) and H. O. C. Ingraham, president of Gen. Chem. Div., Allied Chem. and Dye Corporation, join the board of their sons' firm, Heico, Inc.

Only fly in the ointment is raw material supply. Ammonia, sulfur, soda ash, and caustic soda, essential to sodium ammonium thiosulfate production, are now tight and will soon get a lot tighter. Heico's best bet, therefore, is to get on the defense bandwagon. Its chances look good, for as Cliff Hemphill, Jr. says: "We're not looking for a free ride. SAT will save [the government] time, space, and money. What more can you ask?"

"Intergration"

The big timber-pulp-paper industry in Canada's West Coast province of British Columbia in past months has been undergoing a process of "intergration" aimed at full use of timber and plant facilities—the former involving use of logging and mill waste in pulp and paper operations, and granting by the provincial government of large blocks of timber to big operators on a forestry management license (sustained yield) basis.

Carried out against a backdrop of rising prices and a growing newsprint shortage, the intergration—or consolidation—has involved five major firms,

* Sodium ammonium thiosulfate.

one indirectly, over the past six months. Now another deal involving yet another big firm has taken place in the sale of Sorg Pulp Co.'s kraft pulp plant at Port Mellon on the B. C. coast to Canadian Forest Products for $3 million.

The Port Mellon mill, one of B. C. Pulp Co.'s old operations, was taken over by Sorg during the last war, was modernized and produced kraft pulp for Sorg's big eastern mills. It was closed down a year because of a falling kraft price.

Canadian Forest Products plans to spend some $10 million to make a first-class pulp operation out of the Port Mellon plant to take advantage of higher prices.

Meantime, Canadian Forest Products, which has extensive timber holdings on the coast in addition to lumber mills and a plywood plant, is installing a $50,000 chipper plant at its Youbou lumber mill near Duncan on Vancouver Island to supply the new $18 million H. R. MacMillan sulphate pulp plant near Nanaimo, which opened last summer as a 200-ton daily operation.

The Sorg-Forest Products deal follows close upon the taking over of British Columbia Pulp and Paper Co.'s two rayon pulp mills at Port Alice and Woodfibre by Abitibi Power & Paper Co., Ltd., which acquired 90% of B. C. Pulp's common shares in a $20-$25 million deal. In this transaction it was announced that Alaska Pine Co., Ltd., third largest lumber operator in B. C. would "integrate" its operations with Abitibi's B. C. plants. Earlier, it had been reported that Abitibi would purchase Alaska Pine facilities, under the direction of brothers Leon J. Koerner, president, and Walter Koerner. Following the formal announcement of the Abitibi-B. C. Pulp deal, the Koerners announced they would integrate their operations with those of B. C. Pulp-Abitibi, debunking the sale proposition.

Previous to this deal, several months ago, two major B. C. lumber and pulp-newsprint operators, Pacific Mills Ltd. and Canadian Western Lumber Co., Ltd., formed a new company, Elk Falls Co., Ltd., to construct a new $40 million newsprint plant, initial capacity 75,000 tons at Duncan Bay on Vancouver Island.

Meanwhile, construction of another newsprint plant in B. C. is suggested in the annual report of the Newsprint Association of Canada. The Association says the Bowater concern may be interested in a mill somewhere in the Fraser Valley.

Tung Trouble

Cessation of trade with Communist China is depriving the U. S. of some products upon which it has long been dependent. One of these is tung oil, receipts of which from the Far East have been dwindling for some months, but which will be shut off entirely unless meager supplies should reach this country through other channels. If the United Nations declares an embargo against China, however, there will not even be a trickle.

TUNG ORCHARD (Miss.): Onus and opportunity.

The infant American industry has not at its peak performance been able to supply more than 25% of domestic consumption, and the crop just harvested will not even do that: Severe frost damage has cut the anticipated yield from about 26 million pounds in the 1949-50 season to about half that in the 1950-51 season.

As in World War II, when Chinese supplies were completely cut off, industries which use tung oil, principally the paint and varnish industry, will be forced to substitute other drying oils.

From a peak of 159,329,562 pounds in 1937 and a more recent one of 129,578,355 pounds in 1948, China's exports of tung oil to the United States dropped to 43,441,350 pounds in 1949 and were probably below that in 1950, although the official figures for last year have not yet been released. Our total imports in 1949 were only 64,967,627 pounds, or far less than we formerly imported from China alone. (Next to China, our principal foreign supplier has been Argentina, which in 1949 shipped us 16,486,931 pounds. Other areas in which tung is produced include Paraguay, Brazil, Africa and Australia.)

Needed for defense: Besides its use in industry, tung oil also has important war uses. During World War II all U. S. production was taken over by the Government. Cartridges and shell cases were coated with this product and many uses were also found in the aeronautical field.

Tung trees have been grown in China for centuries, and their product, once known as chinawood oil, has been an article of commerce since China was opened to foreign trade. Trees were brought here from China in 1905, but original plantings in California did not thrive and later experiments were conducted near Tallahassee, Fla. However, it was not until 1932 that the first tank car of tung oil was shipped from Gainesville, Fla., where the trade had its commercial beginning in this country.

From that time the domestic industry has grown with remarkable speed—from about 350,000 tung nut trees in 1930 to more than 10 million now. Meanwhile the industry, both in tree growing and oil production, has spread westward through the southern areas of Alabama, Mississippi and Louisiana, with small production in Georgia and East Texas.

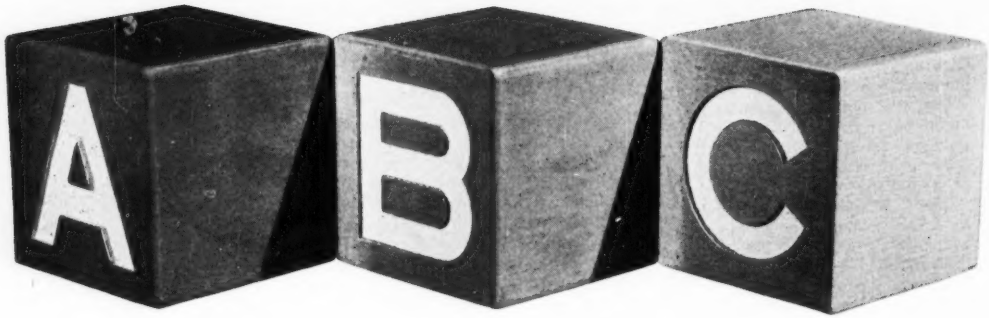
Mississippi leads all other States in the production of tung nuts. Of the 88,000 tons grown in the 1949-50 season, Mississippi produced 43,600 tons, Louisiana 26,000 tons, Florida 16,200 tons and the remainder was scattered among Georgia, Alabama and Texas.

Aids agriculture: One great advantage of tung nut growing to the South has been its contribution to diversification of crops, which agricultural experts have been preaching to Southern planters for decades.

Although large groves predominate in the industry (there's one of 9,800 acres near Picayune, Miss.; one of 6,000 acres near Bogalusa, La.), there are also many small plantings.

In its earlier days tung production suffered from the machinations of ruthless promoters and gullible and inexperienced growers, but the educational work done by the U. S. Department of Agriculture and State agriculture experiment stations, together with the stabilizing influence of the American Tung Oil Association, has placed the industry on a sound basis.

The foregoing figures chronicle a success story for this relatively young industry. The current situation gives it not only the onus of responsibility, but also the opportunity for further expansion.



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Rot Research

Fabric and leather rot is the bane of the tropics. War in the South Pacific brought U. S. armed forces sharply up against it, and now war in Korea renews emphasis on the problem.

Postwar research in Germany, still continuing, is pointed to its solution—which would save millions of dollars a year—both in military items and, more important, civilian goods.

Permanent-type impregnants—such as chrome dyes and copper salts of phenols—seem to hold the most promise.

German scientists are currently wrestling with an old problem: how to prevent fabrics (especially wool) and leather from rotting in warm, humid climates.

Not only is rotting inconvenient, but terrifically expensive. Millions of dollars worth of leather and fabric disintegrate every year as a result of moths, beetles, termites and microorganisms—but the worst offenders are soil bacteria. Chief among these are B. mesentericus and B. subtilis.

Much damage occurs in paper mills and textile plants, and workers' shoes—which carry the bacteria in from the outside soil—are the "Typhoid Mary's" that spread the trouble.

The German investigators are seeking to nullify the presence of these microbes by making the fabrics or leather bacteriostatic (inert to microorganisms) or even bactericidal.

Various methods of treating wool were attempted. Progress of bacterial action was followed by dyeing the wool with Cotton-Blue Lactophenol, a dye which turns blue with damaged fibers but is colorless with unaffected yarn.* The fibers were examined at intervals to check the degree of damage.

Chrome-dyed wool proved to be the best finishing treatment, with the concentration of chromium determining bacteriostatic effectiveness. Nature of the dye is unimportant.

Treatment of wool with acid after processing yields protection as long as no alkaline reaction, which often arises from the metabolic products of bacteria, persists. Neutral material is also quite susceptible to damage.

Inorganic acids, such as sulfuric acid, impede the bacteria better than an organic acid like lactic acid. The extent of resistance appears to be a function of the residual acid contained in the fabric. Mothproofing aids in rendering acid and vat dyed wools more resistant to microbial attack.

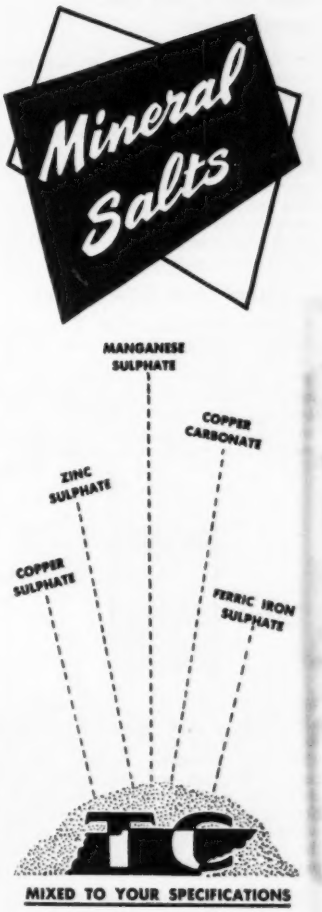
These results were promising enough to warrant a further search for protection against saprophytic and disease-causing organisms. It was hoped that this would eliminate or reduce the number of disease germs on clothing, laundry and bedding, and thus minimize infection of people. Compounds with known bactericidal, antiseptic and disinfectant properties were examined.

Bactericidal dyes, including Meldola's Blue, methylene blue, Prontosils (sulfonamides), and chrysoidine, were found wanting in their inhibitory effects on saprophytic bacteria. These dyes are mainly active against cocci.

FABRIC STUDY: Worst offenders are microscopic.

Various germicidal acids—salicylic acid, cresol and boric acid—were much more promising. Cresol inhibited bacterial growth, even in an alkaline medium. Use of an impregnating agent, together with mono- and polyhydroxy phenols, gave encouragingly positive results. Chlorocresol, tri-

* This is due to the fact that the dye colors only the carotene C present in the "spindle" cells of the decomposed wool, but doesn't color the carotene A on the wool surface.



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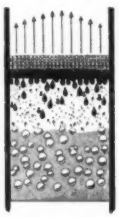
New Method of entrainment separation cuts costs and speeds production

By applying the principle of impingement filtration to liquid-gas separation processes, Metex Mist Eliminators have effectively reduced costs, increased throughput and improved end-product quality in evaporators, scrubbing towers and similar refining operations. Baffles, centrifugal chambers and additional head room are not required, nor is it necessary to slow down operations to secure 90% or better entrainment removal.

Metex Mist Eliminators

A Metex Mist Eliminator is a pad, built up to the desired thickness from multiple layers of wire mesh, *knitted* —not woven—of corrosion-resistant metal. Constructed in sections for easy assembly, and cut to fit, Mist Eliminators are installed inside refining equipment and across the line of gas flow.



Having a high free volume (often 98%) there is practically no impedance to flow, yet the multiplicity of wires effectively prevents "straight line" passage of gases, and "wipes out" the entrained liquid. As this impinged liquid accumulates, it grows into drops which break off and fall back against the rising flow, allowing the gas to pass through, freed of all entrainment.

Applications

Installations to date have been largely in petroleum refining and petro-chemical operations where increased production, purity of output and lowered costs have been repeatedly demonstrated. That the use of Metex Mist Eliminators in other operations where purification of gases is essential, will be similarly effective is indicated by this record of performance.

Our engineers will be glad to consult with you on the possible adaptability of Mist Eliminators to your processing operations. A letter, addressed to Mr. R. L. Hartwell, Executive Vice President, outlining briefly your process and the products involved, will bring a prompt reply and a copy of our brochure, "Metex Mist Eliminators". No obligation of course.

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chlorophenol, and hydroquinone were most effective, with salicylic acid and thymol nearly as good. Resorcinol and benzoic acid were quite inferior, while phenol was the least effective.

Technical disinfectants were quite ineffective alone, but were materially aided by impregnating agents. Increased protection periods were obtained.

Treatment with copper sulfate did not materially improve resistance. Better results were obtained when the copper compounds were precipitated on the fabric in an insoluble forb, but results weren't good enough.

The combination of copper's antiseptic effects with the disinfecting power of aromatic phenols seemed to do the trick. Copper salts of benzoic acid, salicylic acid, phenol, trichlorophenol, chlorocresol, thymol, phloroglucinol, resorcinol, hydroquinone, pyrocatechol, gallic acid, alpha and beta naphthols, mandelic acid and hydroxyquinoline were tested. They showed high bacteriostatic effects—almost equal to that of the chromed samples.

Research is still continuing—to see which of these various treatments is best or—even more desirable—if a still better method will turn up. The copper salt of hydroxyquinoline is widely used in this country, of course, but current research, both here and abroad, may discover a worthy competitor.

Pressure Relief

High blood pressure is now under attack by a new weapon—adrenergenic blocking agents. These drugs block the rise in blood pressure caused by injection or extra secretion of adrenalin. One now being studied by Smith, Kline & French can be taken by mouth, may conceivably—if clinical tests are successful—minimize the danger of strokes.

Known by the laboratory name SKF 688, the compound is N-phenoxyisopropyl-N-benzyl-β-chloroethylamine. Animal studies have shown that this and related compounds are unique in that they block the constricting effect of adrenalin on the peripheral vascular system (the blood vessels of the limbs and many smaller vessels in the body). This constriction by extra quantities of adrenalin, either secreted or injected, raises blood pressure.

If a drug of this type is given beforehand, however, constriction is prevented to the point where blood pressure rises only slightly or not at all. The drug itself has no effect on blood pressure; it only counteracts the effect of adrenalin.

Toxicity tests have shown that the drug is safe for humans, and completion of tests now in progress may clear the way for wide clinical use of this new type of synthetic chemotherapeutic agent.

Chemical Bracer

Research at Calco Chemical Div. (American Cyanamid Co.) has paid off with a new drug, effective against Parkinson's disease. A synthetic product*, the drug bears the name Artane and is now in full-scale production at Calco's Bound Brook (N. J.) plant.

JOHN J. DENTON: A steadying influence for palsied limbs.

Exerting a striking antispasmodic action necessary to steady the shakes and quivers caused by the disease (commonly called "shaking palsy"), Artane shows promise as a general antispasmodic. Atropine and papaverine, more established in this application, received due consideration in the work leading to the discovery of the new pharmaceutical, and numerous synthetic derivatives were prepared for clinical study. Of these, several ester analogs of atropine gave the desired effect though much less potent than atropine itself. Besides, the ease with which these esters are hydrolyzed rules out their use.

Lion's share of credit for Artane's discovery goes to John J. Denton, guiding spirit of Calco's symptomatic drug research. This is not Denton's first gift to medicine. Best known for his work on Hetrazan, used in treating filariasis, Denton's five years as a pharmaceutical research director have forwarded chemotherapy.

* (3-(N-piperidyl)-1-phenyl-1-cyclohexyl-1-propanol hydrochloride.)

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Rapid and complete solubility of Hooker Sodium Sulfide and Sodium Sulfhydrate can mean substantial savings in time and manpower. The flakes dissolve almost instantly, without agitation, even in cold water . . . no sludge settles out, even after standing for hours.

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Mol. Wt. 78.1
M.P. . . . . 100° C

Light buff colored solid in flake form. Rapidly soluble in water; slightly soluble in alcohol; insoluble in ether. Also available in solid form.

ANALYSIS

Na_2S	60 to 62%
NaCl	1.5% Max.
Other Na Salts	2.0% Max.
Fe	8 ppm Max.
Cu, Ni, Cr, Mn, Pb	1 ppm Max.
Water of crystallization	35% Min.

USES

In manufacture of dyestuffs, chemical intermediates, straw and kraft pulp, rubber, as an ingredient of dye liquor for textile dyeing; boiling out linen; ore flotation and metal refining; in unhairing hides and wool pulling; desulfurizing viscose rayon.

SHIPPING CONTAINERS

Flake: Steel drums . . . . . 90 & 350 lbs. net
Solid: Steel drums . . . . . 625 lbs. net

SODIUM SULFHYDRATE—NaSH

(sodium hydrosulfide)

Mol. Wt 56.1
M.P. . . . . 55° C

Light lemon colored solid in flake form. Completely and rapidly soluble in water, alcohol and ether.

ANALYSIS

NaSH	70 to 72%
Na_2S	2.5% Max.
NaCl	0.8% Max.
Na_2SO_3 and $NaHCO_3$	0.4% Max.
Fe	5 ppm Max.
Cu, Ni, Cr, Mn, Pb	1 ppm Max.
Water of crystallization	28 to 26%

USES

In preparation of dyestuffs and other organic chemicals such as thioamides, thiourea, thioglycolic acid, thio- and dithio-benzoic acids, sodium thiosulfate; in unhairing hides, in desulfurizing viscose rayon.

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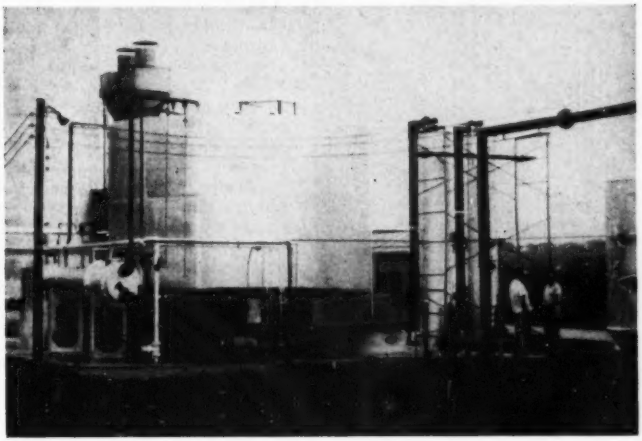


FUNGAL AMYLASE AT MUSCATINE: Grain Processing Corp.'s tests indicate a saving of 3-4¢ per gallon in alcohol from corn.

Grain Alcohol Without Malt

Lower-cost industrial alcohol from grain is in prospect. Fungal amylase replaces the time-honored barley malt in converting the starch in the grain to fermentable sugars. Savings of 3-4¢ per gallon at present price levels are indicated.

Bacterial amylase, now in production by Takamine Laboratories for use in textile desizing, is also under test.

Commercial-scale experiments, using 100,000 gallon fermenters, have just been completed and evaluated by USDA's Northern Regional Research Laboratory in conjunction with Grain Processing Corp. at Muscatine, Iowa.

The present emergency has focused attention on the high cost of producing ethyl alcohol from grain. Evaluation of commercial-scale tests, in which fungal amylase replaces barley malt, have just been completed at the government's alcohol-from-grain plant at Muscatine, Iowa. Grain Processing Corp., lessee of the government plant, cooperated with USDA's Northern Regional Research Laboratory, who developed the fungal amylase process, in this work.

Although these tests indicate a saving of 3-4¢ per gallon at present price levels, alcohol by this process will not be competitive with that produced by direct synthesis or by fermentation of black strap molasses (CI, Oct., 1950, p. 558). Nor can fungal amylase replace barley malt for whiskey production, as the flavor is not the same. Its use is limited to production of industrial alcohol and grain neutral spirits.

Fungal amylase is an enzymatic material produced by the fermentation of a mixture of a culture of *aspergillus niger* NRRL 337, ground corn (1%) and calcium carbonate (0.25-0.50%) in a thin stillage with a solids content of about 5%. The product of this fermentation with additional ground corn and additional stillage, when cooked, provides the mash to feed to the final alcohol fermenters. Heat-damaged corn gives good results.

No change: Use of fungal amylase instead of the usual barley mash required no change in three of the four sections of the Muscatine plant: fermentation, distillation and feed recovery.

At the time that the experiments were carried out the plant was producing grain neutral spirits for beverage purposes. Judged by organoleptic tests (CI, Nov., 1950, p. 721), the four-column still gave a product of suitable quality.

By-product feedstuffs were recovered by the usual methods. Chemical analysis indicates that the feeds are practically the same as feeds from the regular malt fermentation. Samples of distillers' dried grains and distillers' dried solubles were submitted to the University of Nebraska and to the Bureau of Animal Industry. Preliminary testing indicates that they have the same feed value as malt feeds.

Use: The process can only be used in those plants where the total production can be set aside for industrial purposes or for the production of grain neutral spirits for beverage purposes. Ideal candidates for conversion would be the Schenley plant at Kansas City, which was recently purchased from the government in a partially cannibalized condition, the government plant at Omaha, Neb., and to the Muscatine plant. It has been estimated that the cost of the additional equipment for production of fungal amylase at the Muscatine plant would be about $400,000.

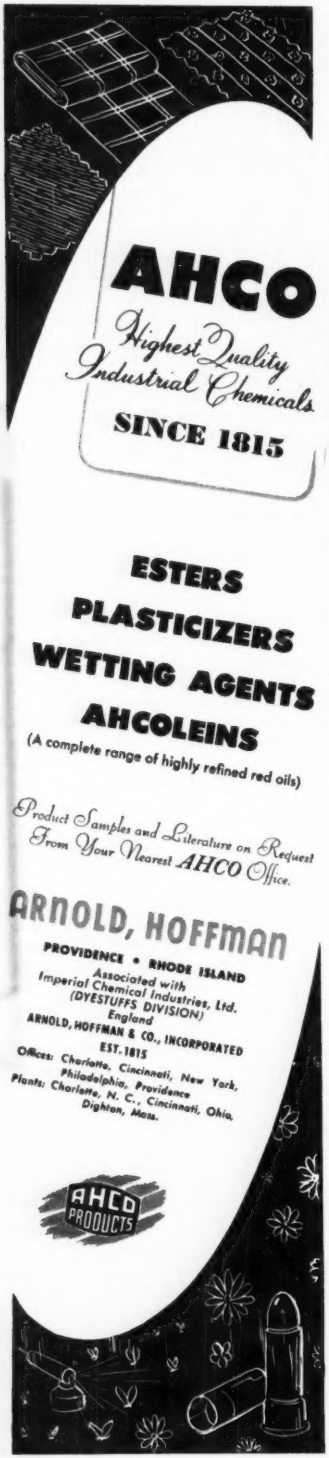
Bacterial amylase is also being tested as a barley malt replacement. This enzyme has been in production as a dry powder for about 1½ years by Takamine Laboratories for sale as a textile desizing (starch removal) material.

Fungal amylase should be produced at the point where it is to be used whereas bacterial amylase, which is produced by a deep-tank fermentation, can be reduced to a dry powder or as a stable concentrated solution and in these forms shipped to any part of the United States. Thus an alcohol distillery would have no waste material from its malt production.

Waste disposal can be almost completely eliminated with bacterial amylase if granulated wheat flour is substituted for corn. This greatly expands the number of possible distillery plant locations.

A further advantage of bacterial amylase is that it is less heat sensitive than fungal amylase, simplifying the malting procedure. Although too early for exact figures to be available it is expected that costs using the bacterial amylase will be about the same as when using fungal amylase.

Next: The next move is for industry to make small scale evaluation tests for plants to be built or rehabilitated to ascertain for each case whether the extra investment will be counterbalanced by the savings which are promised.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Waste Sulfuric

Last sulfuric acid "disposer" to be placed in service is a surplus Navy LCM. Bay Cities Transport Co. has installed four rubber-lined steel tanks with a total capacity of 197 thousand gallons. Three trips per week will be made for disposal of the acid from the tin plate pickling line of Columbia Steel Co. at Pittsburg, Calif. Dumping is at least 25 miles at sea by gravity through valves in the bottom of the tanks.

Fungineering

Fungus growth and resultant deterioration of process equipment, particularly instrument parts, is not limited to tropic climes. Equipment in such temperature locations as Washington and Philadelphia has suffered severe fungus damage.

Thus the continuing research work of the Navy Bureau of Ordinance, directed by head mycologist, Walter N. Ezekiel, is of immediate value to practically all chemical plant builders. The Navy's work is the outgrowth of attempts to solve the problems occasioned by severe fungus growths encountered by Naval vessels of the Pacific.

WALTER N. EZEKIEL: Fungus control by fungineering.

Three preventives: Equipment can be made inert to fungi (funginert) by keeping it dry, designing it free of "nutrient" materials, or by use of fungistatic coatings over fungus-susceptible parts. Fungi do not grow when the relative humidity is less than 65%; short-term protection can be provided by covering the part with a coating that actively prevents growth oi fungi; and funginert materials generally can be substituted for "nutrient" materials at little or no extra cost.

Use of funginert materials usually is better than application of fungistatic coatings as they can be expected to remain permanently fungus-proof.

Good and bad: Some "nutrient" and funginert materials include:

"Nutrient"	Funginert*
Wood	Mica
Cork	Nylon
Linen	Ceramics
Cotton	Silicone
Leather	Polystyrene
Cellulose nitrate	Cellulose acetate
Hair and wool felt	Polyvinyl Chloride
Cardboard paper	Teflon
Regenerated cellulose	Polymonochlorotrifluoroethylene
Plastics with wood-flour or cotton fillers	Polymethylmethacrylate
Starch sizing	Mica- or glass-filled melamine
	Metals

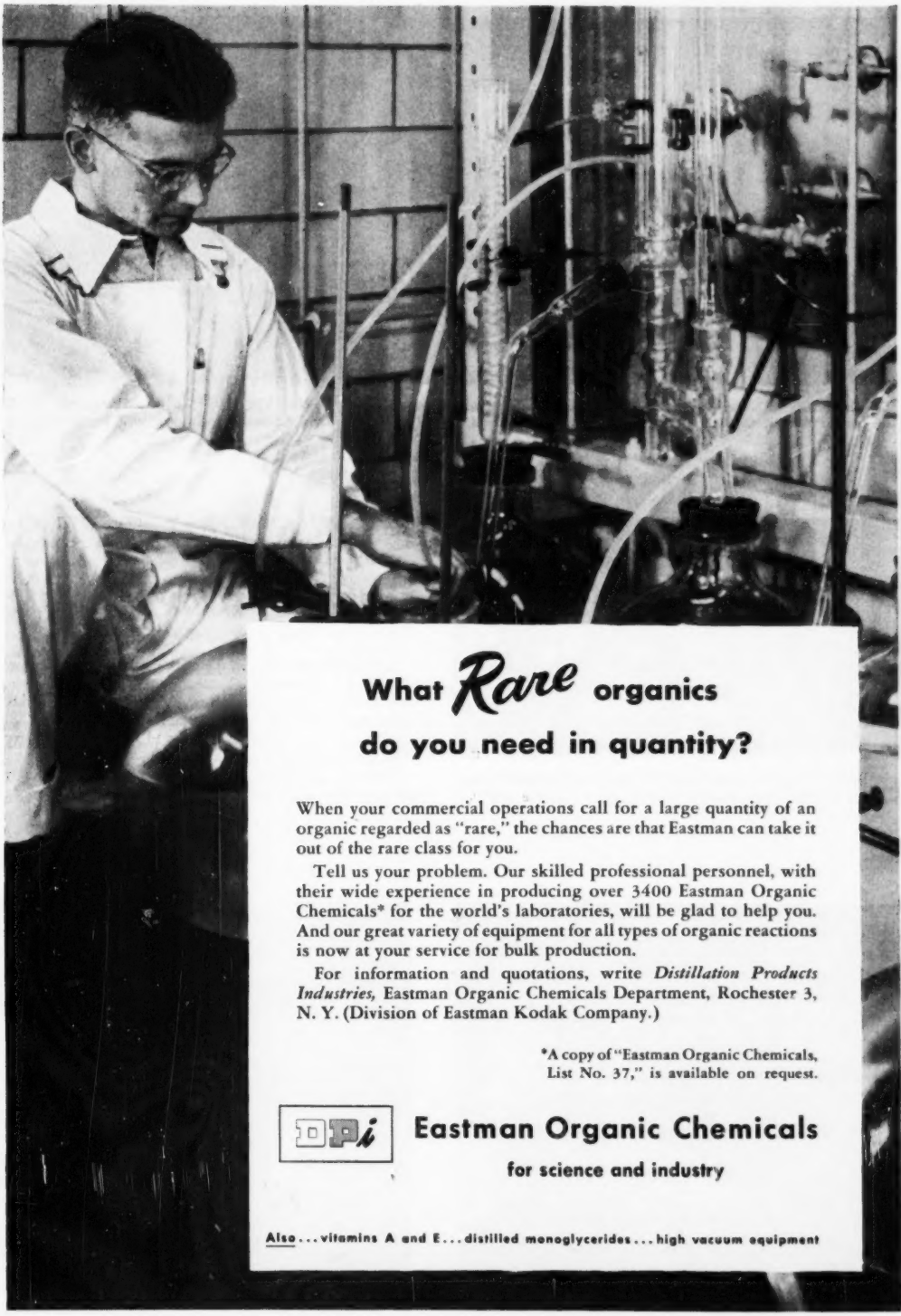
Fungistatic coatings usually are varnishes, lacquers or waxes which contain a fungicide. Phenyl-mercuric compounds and salicylanilide, alone or in admixture are specified by the services in a number of different coatings. Pentachlorophenol is also used in some of the coatings supplied by the dozen paint and varnish manufacturers, who supply these coatings.

Although fungus control studies have been made largely for military use, the knowledge obtained can be put to good use by industry.

Laminated Tubing: Fiber glass reinforced plastic tubing and piping, Glasweld, is now being manufactured by the United States Plywood Corp. for use in the process industries. Of particular interest is the great strength of this material, reportedly capable of withstanding pressures up to 5000 psi.

General Electric Co.'s new pyrometers have a calibrated accuracy of ± 0.75%. Their thermocouple is connected with a millivoltmeter where a 3¼-pound magnet provides a higher flux density than in the usual instruments.

* Provided they do not contain nutrient plasticizers or other nutrient materials.



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*A copy of "Eastman Organic Chemicals, List No. 37," is available on request.

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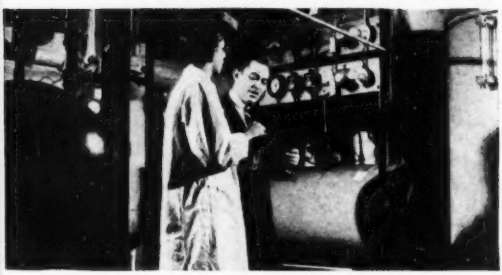
1 DECISION to launch air freshener is made by Sales Head Schenberg, President Samuels and Research Director Shepherd.

2 VAPOR PRESSURE must conform to ICC Regulations. Chemist checks proposed formulation.



5 PROPELLENTS under close temperature-pressure control are blended and dehydrated (left) before storage (right).

SPECIALTIES..

Push-Button Product

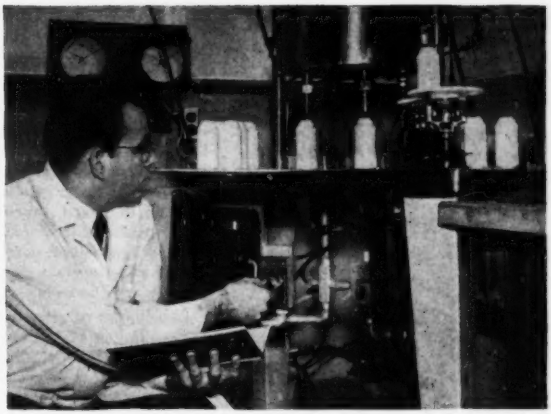
Newest of the line of aerosol products manufactured by Bostwick Laboratories, Connecticut Chemical Research Corp. subsidiary, is Fleet Air Refresher. Although insecticides comprise the largest percentage of aerosols sold (about 70%), air deodorants are second in sales, and eventually are expected to equal insecticides.

Ease of operation and efficiency of an active ingredient dispensed in colloidal form have won consumer acceptance

7 HIGH-SPEED FILLING is carried out at —30 F. Girl behind plant manager and Shepherd is setting valves in cans.

8 WATER IMMERSION TEST weeds out any leakers. Air freshener is moving in front line; other product, in rear.

3 LABEL DESIGN progresses concurrently with research. Designer shows Shepherd sample.

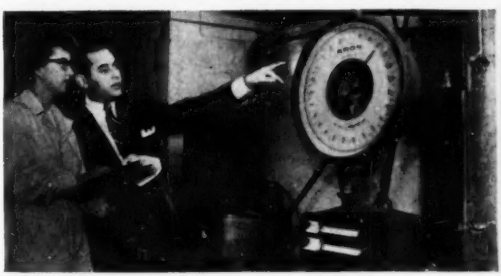


4 PILOT UNIT production follows development of formula. Trial cans are filled, weighed and have valve crimped on.

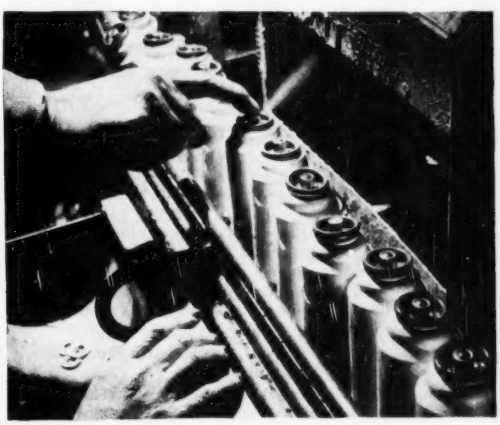
for specialties packaged as aerosols. Some 30 million units were sold last year. In addition to insecticides and deodorants, types of products on the market include waxes, paints, mothproofers, plastic sprays, cosmetics and pharmaceuticals.

Developing an aerosol is more than a routine packaging job. Propellents and valves are factors a specialties manufacturer does not normally have to consider, and involve additional research and development work. Since the last war, many companies specializing in such gas-propelled products have sprung up, and some older companies have installed their own filling lines.

Prospects of war, however, may slow commercialization of products under development and restrict the types of aerosols that can be made. Insecticidal aerosols for the armed services will get top priority on available containers, propellents and active ingredients.



6 ACTIVE INGREDIENT concentrate is weighed out. Shepherd, who also heads production, consults with control chemist.



9 VALVE OPERATION is checked. Light finger pressure should actuate valve, deliver contents as a fine mist.

10 CONSUMER APPEAL is important, so lithography is inspected before packaging at the Bridgeport, Conn., plant.

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Magic Slate

Smudge-proof labeling tape made by sandwiching a waxy writing surface between two layers of acetate film is now being produced in a variety of colors and widths. In use, the middle layer is displaced by pressure of pencil, typewriter or stylus, outlining the impression in the color of the bottom acetate film; top film of clear acetate gives protection from soiling, smearing or erasure.

Labelon, as this new tape is called, is the product of Labelon Tape Co., Rochester, N. Y., an affiliate of Rochester Ribbon & Carbon Co. Only 5/8" and 3/4" widths in black and blue were available when it was first introduced, but now 1" and 1½" widths and the colors green and red have been added to the line. Rolls suitable for use in industry are 400" and 800" in length; for the home, 80" and 150".

Although Labelon resembles a schoolboy's magic slate, the upper piece of the sandwich cannot be lifted to obliterate the impression. The tape is pressure-sensitive, so it sticks without moistening to metal, plastics, paper or any smooth surface. It can easily be stripped off for disposal or for remounting in permanent records. Labelon is being used in laboratories, tool cribs, stock rooms, chemical and food processing plants, many industrial plants for identifying component parts, service departments, inspection departments and in the home and office. In these applications, differences in color are often useful. At Brookhaven Laboratories, for example, radioactive materials are labeled with red (color) tape.

Carbon paper offspring: Most of the materials as well as many of the techniques used in the manufacture of the new tape were borrowed from the carbon paper and ribbon industry. E. B. Brewster, the man who developed it and whose name is on the patent applications, is president of Labelon and the parent company, Rochester Ribbon & Carbon. The idea for the product was born in an over-the-cocktail discussion between him and Fordyce Tuttle, chief engineer of Eastman Kodak's Camera Works. At first regular carbon paper and matte acetate, a Kodak product, were tried, but Brewster discarded these for Labelon in its present form.

The waxy coating applied to the top layer of acetate is a component of certain dopes that Rochester Ribbon uses for coating carbonizing tissue. To apply this, techniques of strip coating were literally lifted from the company's methods for inking typewriter ribbon in multi-color combinations. The company, however, is not in a position to make adhesive tapes, so the bottom layer is purchased from Minnesota Mining & Manufacturing Co. in the various colors in which Labelon is offered.

BILL BREWSTER: Carbon paper industry and a schoolboy's tool.

Self-effacing Bill (from middle name Billings) Brewster points to Tuttle's reputation as an idea man and to the abilities of his associates Gardner Soule and William Dechau in speaking of Labelon. Dechau, a 40-year man in the carbon paper business, is behind some of the machinery developments that made Labelon possible; Soule, a young man (Williams '43), is doing an outstanding job in sales.

But Brewster, also young (36), has a habit of coming out on top, and to him must go a good share of his company's success. In 1934, he contracted tuberculosis while working too hard to pay his own way through college, was told he wouldn't live. After three years on his back in New Mexico, he finished college at the University of Colorado, receiving a degree in business administration, and went to work for Eastman Kodak as a statistician. He left them in 1943 for more money as assistant to the general manager of Fasco Industries (ventilators), saved his money and, with the help of bank loans, bought Rochester Ribbon & Carbon. In four years since he took over, business has tripled and profits have shown an eight-fold increase.

Only a starter: Not only is Labelon a new product that is rapidly winning wide industry acceptance, but it has led Brewster and his associates into

two new fields. One, printing acetate and cellophane Scotch tapes, is competitive, but Rochester Ribbon has won a good foothold, and is confident of increasing it.

The other is Labelon combined with a carbon backing instead of the pressure-sensitive material. This new material eliminates use of either a carbon between it and the sheet above it receiving the impression, or a carbon between it and the sheet below it. This can do away with the need for ribbons in certain mechanical recording machinery (and make design simpler) since the Labelon-carbon paper, like Labelon Tape, takes a contrasty impression from pressure only.

Golden Finish

Aurillium is the trade name of a new automobile finish which Phillips Products, Chicago, is now marketing in the Midwest, will soon move into other areas. It is packaged in a 12-oz. aerosol dispenser for Phillips by Chase Products, Maywood, Ill. Principal outlets for this $2.50 retail item are automotive supply stores.

There is no wax in the formula, but it does contain a small amount of a silicone. It is not sold as a polish, for use of a polish is said to be unnecessary when this protective coating is applied to a clean car. One container will cover a car twice, and if the second coat is applied 4 months after the first, sixteen months protection can be expected from one can.

Claims made for Aurillium parallel those for non-aerosol silicone polishes. Phillips, however, says that the silicone is used solely to give an immediate sheen to attract the consumer before the product's long-life characteristics win him.

Although Aurillium is now being promoted for use on automobiles, it can also be used on furniture and other household items. One limitation is that it cannot be applied over linseed oil-base paints.

Ban on lye: A bill introduced in the North Carolina legislature would prohibit the sale of concentrated lye except for industrial purposes. This would hit small cans sold for drain pipe opening, etc., for the smallest package permitted would be 10 lb. If the bill becomes law, it will become effective July 1.

Farm land lab: New facilities for research on insecticides, herbicides and rodenticides have just been opened by John Powell & Co. at Port Jefferson, N. Y. in the center of the Long Island agricultural area. There are 8 acres suitable for farm programs involving agricultural chemicals and for greenhouses. The new building contains 10,000 sq ft of floor space.

New ink: A newly developed ink has made possible a new nylon type writer ribbon which provides sharper writing and last longer. Made by Underwood Corp., Hartford, Conn., the ribbon comes in black and black-red combinations with medium and light inkings.

Dairy insecticide: A combination of methoxychlor and lindane is the basis of a new insecticide introduced by Du Pont for use in and around dairy buildings, and for occasional spraying of dairy cattle. Both these chemicals have USDA approval for such use. Known as Du Pont Dairy Barn Insecticide, the formulation is a wettable powder available in several package sizes.

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If you are interested in improving the quality of your end products, whether it be cosmetics, soaps, creams, esters, stearates or other compounds requiring Stearic Acid, it will pay you to make a note of these superior Stearic Acid #1225 qualities.

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Cosmetics made from #1225 Stearic Acid are free from reversion or masking of the odor imparted by fine perfumes. Esters made from #1225 Stearic Acid are extremely bland in odor with excellent final color.

LOW CONTENT OF UNSATURATED FATTY ACID

is indicated by extremely low iodine value and means a saturated fatty acid content of 98% to 100%.

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in manufacture of Esters, Soaps, Creams and other compounds, #1225 Stearic Acid shows a maximum resistance to darkening.

HIGHEST PURITY

Virtually free from unsaponifiable matter and mineral ash due to special new process of manufacture.

SPECIFICATIONS

Titre (130-132°F)	54.5 — 55.5°C
Color 5—¼" Lovibond Column (max)	2 Yellow — 0.2 Red
Iodine Value (Wijs)	0.5 — 1.5
Free Fatty Acid (as oleic)	103 — 105%
Acid Number	205 — 209
Saponification Value	206 — 210

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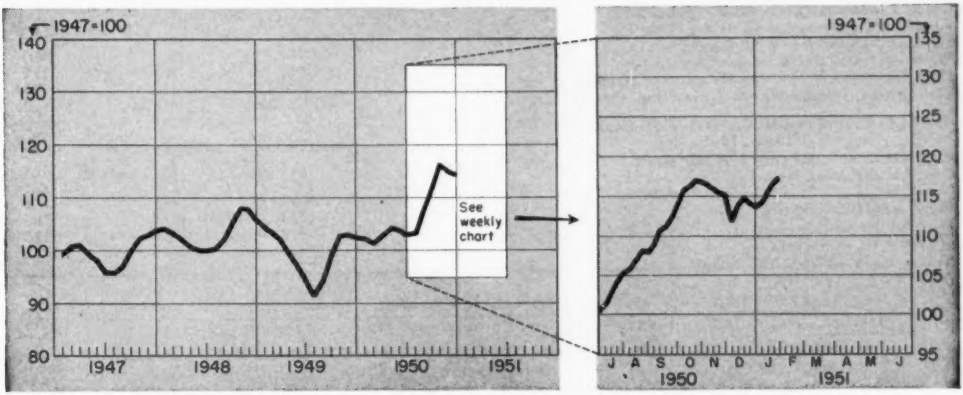


CHEMICAL INDUSTRIES OUTPUT INDEX—Basis: Total Man-Hours Worked in Selected Chemical Industries

Rumblings of the giant U. S. industrial machine are getting louder in the chemical industry. The first restrictions on closely allied commodities—rubber and metals—were followed last week by end-use limitations on chlorine and related methylene chloride.

Good prospects for early additions: benzene, sulfur, styrene, glycerine.

Some unhappy formaldehyde users may find their supplies going up in smoke to meet military demands for pentaerythritol and hexamine explosives. Total consumption has been running 20% over production capacity in recent months, with urea and phenolic plastics continuing to take the lion's share.

Under scrutiny by GSA is the billion pound aluminum offer by the Aluminum Co. of Canada from a to-be-built plant in western Canada. Admitting that considerably more of this vital defense metal will be needed, domestic producers are confident they can do the job as well as Alcan—and a lot quicker.

Brightest statistic of the week: An all-time crude oil production record, edging 6 million barrels, was set last week, reflecting a liberalized quota from the Texas conservation authority for the month of January.

Faced with growing competition of the new synthetic fibers, rayon and cotton demand continued to advance on all fronts.

Present rayon production capacity of 1.4 billion pounds annually will be increased 6% by midyear, and another 10% by October, 1952.

Cotton growers are aiming for 16 million bales next season, up 40% from last year's below-average crop. Of this total, between 5-6 million bales are headed for export unless the government should decree otherwise.

Chromate supplies present a logistics problem. There is still plenty of high-grade chromite ore in the Transvaal, but cargo facilities are limited by an undersized merchant marine. When the flow of ore is finally assured, major consumers in metal treating and leather industries can then cogitate on soda ash supplies for converting chromite to chromate.

MARKET LETTER

WEEKLY BUSINESS INDICATORS	Latest Week	Preceding Week	Year Ago
Chemical Industries Output Index (1947=100)	117.4	117.4	100.7
Bituminous Coal Production (Daily Avg. 1,000 tons)	1,863.	1,970.	1,210.
Steel Ingot Operations (% of Capacity)	101.3	100.9	88.8
Wholesale Prices—Chemicals and Allied Products (1926=100)	144.9	144.9	115.8
Stock Price Index of 14 Chemical Companies (Standard & Poor's Corp.)	213.1	215.7	158.9
Chem. Process Industries Const. Awards (Eng. News-Record)	$59,172,000	$19,542,000	$521,000

MONTHLY BUSINESS INDICATORS—Wholesale Prices (1926=100)	Latest Month	Preceding Month	Year Ago
All Commodities (other than Farm and Foods)	166.6	163.7	145.4
Chemicals and Allied Products	139.6	135.6	115.3
Chemicals	136.1	134.3	114.6
Drugs and Pharmaceuticals	175.1	163 8	121.6
Fertilizer Materials	115.6	112.0	117.9
Oils and Fats	180.9	171.5	118.2

Few chemicals are as important as chlorine to the chemical process industries. With demand exceeding production by 1500 tons daily, allocations issued by the NPA last week were not exactly unexpected. In order M-31, ten percent of chlorine output has been assigned to meet defense commitments, with adequate supplies assured for uses essential to public welfare; e. g. water purification.

Not yet under allocation is DDT, chlorine progeny and bane to bugs. But with military needs slated to reach 5 million pounds by early summer, most producers are voluntarily setting aside 25% of production for these priority customers. Someone is going to be squeezed.

Another NPA allocation has been issued for ethyl cellulose, up-and-coming plastic with diversified and expanding uses for civilian and military applications. Regulation M-32 reserves 40% for defense orders.

After considerable speculation, verbal, and financial, the price controls imposed last Friday by ESA had an anti-climactic tinge. The first regulations of GCPR had numerous loopholes for wages and farm products, and no provision for import price control. In effect, the measures taken so far are only tentative and preliminary.

Many commodity prices climbed rapidly before the price freeze in anticipation of possible rollbacks. Other commodities displayed uncertainty marked by light trading.

Some of the last minute increases: bituminous coal in the Western Pennsylvania area, 20-35¢ a ton, first general rise in several months; scrap steel, $7 a ton higher in the Buffalo, N. Y. locality; a 12% increase in rubber tire prices.

Office of Rubber Reserve needs 130 million gallons of alcohol for the butadiene plants at Kobuta, Pa. and Louisville, Ky. Its parent agency, RFC, is negotiating with several Eastern distillers to convert 1.2 billion pounds of surplus potatoes in Maine into 12 million gallons of alcohol at a reputed price of 96¢ a gallon delivered.

SELECTED CHEMICAL MARKET PRICE CHANGES—Week Ending Jan. 29, 1951

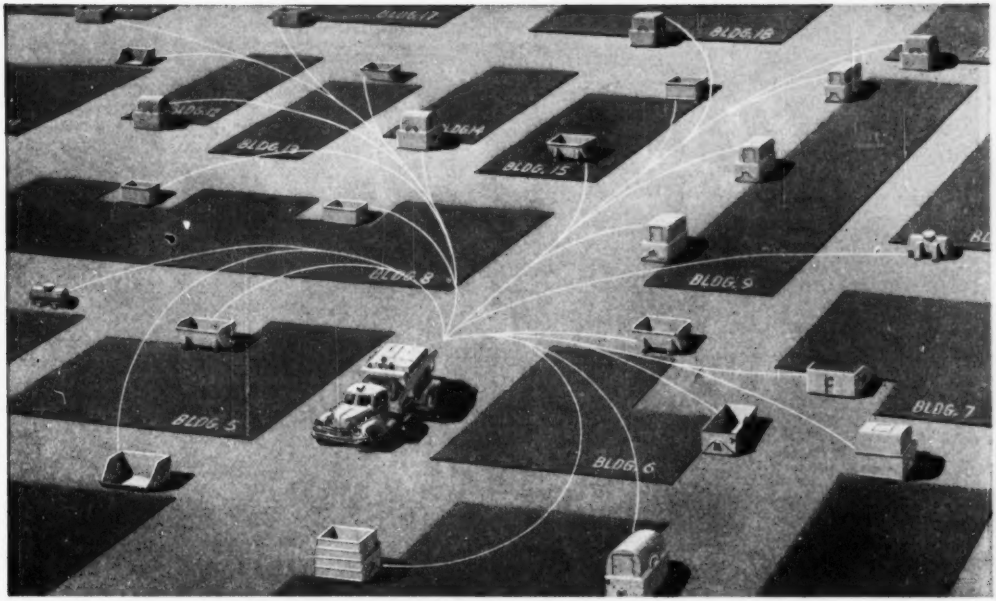
UP

	Change	New Price		Change	New Price
Aluminum Acetate, bbls.	$.03	$ .11	Lemongrass oil, ctns.	$.55	$5.00
Antimony, bulk, c.l.	.10	.42	Linseed oil, raw, tanker	.01	.22
Calomel	.35	4.37	Menthol, nat., USP	.20	14.30
Candelilla Wax	.02	.71	Peppermint oil, USP	.50	8.85
Castor oil, dehyd., bodied, c.l.	.03¼	.39	Safrol	.10	1.40
Castor oil, sulfonated 75%	.01	.26	Sodium stannate, drums, wks.	.01	1.02
Epichlorhydrin, tanks, wks.	.02	.37	Spearmint oil	.65	6.25
Gum Arabic, amber sorts	.005	.15	Tin	.06	1.84
Lanolin, USP, drums	.02	.28	Turpentine, gum, Sav., gal.	.03	.95

DOWN

Carnauba Wax, No. 1, Yel.	.06	1.38	Cottonseed Oil	.005	.29
Rosin, gum, K, Sav., cwt.	.30	9.00			

Prices per lb. unless quantity is stated



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Any required number of Dempster-Dumpster containers are spotted at convenient materials accumulation points inside and outside your plant. They range in sizes up to 10 cu. yds. and are made in various designs to suit your particular needs. Materials — bulky, light, heavy, solids, rubbish and even liquids—are dumped or placed in these containers. The truck mounted Dempster-Dumpster makes scheduled rounds, picks up each preloaded container, carries it to the point of disposal, sets it down intact or dumps the materials and returns the container for refilling. The entire operation is hydraulically controlled and handled by only one man, the driver.

It is not unusual for one Dempster-Dumpster to eliminate up to 10 conventional trucks . . . reducing investment accordingly. This means cutting maintenance costs, tire and gas requirements tremendously. And, more important, it increases production with a minimum of manpower. It will pay you to investigate the Dempster-Dumpster System now! A product of Dempster Brothers, Inc.

Above, the Dempster-Dumpster is shown in the three simple stages of picking-up, hauling and dumping an 8 cu. yd. drop bottom container . . . completing the cycle in one to two minutes. These photos show the ease with which the Dempster-Dumpster handles all containers, regardless of their type, size or whether they are bottom or tilt dumping types.

The important feature to remember is that only one truck-mounted Dempster-Dumpster and driver handles one container after another in an endless cycle, constantly on the move for economy and efficiency never before available in bulk materials handling.

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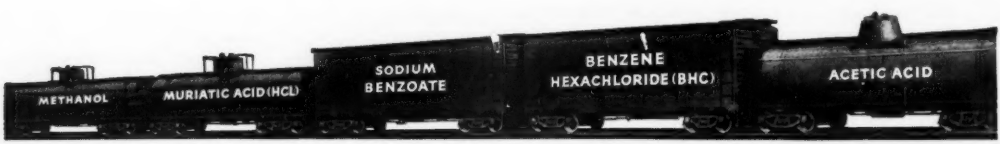

"CHIEF" McDERMOTT: "Security is everybody's job."

Danger: Saboteurs at Work

Security controls tightened by TVA and AEC. Chemical companies step up anti-sabotage measures.

Atomic Security expert tells CIW that sabotage, more than espionage, is big threat in future conflicts.

Warns that new means of infiltration imperil safety of chemical workers and plant equipment.

In the last few weeks a wave of plant security consciousness has begun to sweep the country. It started with the recent edict of the Tennessee Valley Authority that bars the public from all dams, power plants and chemical works of TVA for the duration of the present emergency. TVA's emphasis on security precautions was echoed immediately by the Atomic Energy Commission which has stated that similar stepped-up controls are in the making for its operations.

Chemical companies, among other industrial concerns, quickly caught the spirit of the actions of the two big government organizations. And each day brings notice that another chemical processor is taking steps to protect its manufacturing operations and alert its personnel against the possible actions of saboteurs and spies.

To get the up-to-the-minute story on plant security needs, INDUSTRIES WEEK interviewed an expert on the subject . . . Michael F. McDermott, wartime Superintendent of Plant Security at the gigantic K-25 project of Carbide and Carbon at Oak Ridge and former Deputy Chief Inspector of the Detective Division of the New York Police Department. These two positions devoted to the protection of lives and property have combined to make "Chief" McDermott a leading consultant on the subject of plant protection.

Plant security now, as in World War II, says McDermott, entails two big jobs . . . protection against espionage and protection against sabotage. But during the recent war, he points out, the emphasis was somewhat higher on the first task. This was because it was often more to the enemy's advantage to spy on and copy our production operations than it was to destroy them. If an all out conflict were to come in the future, however, sabotage and plant destruction would be the main purpose of enemy agents.

Security must start with the government, says McDermott . . . but that's only the start. All the good work of the FBI, Military Intelligence, and other federal, state and local authorities goes for naught if the managements of the plants being protected won't cooperate and show a little gumption in initiating their own security systems. Because the companies concerned obviously know more about the fine points of their operations than an outside agency can, they are often best fitted to diagnose the points of vulnerability in their plants to sabotage and espionage. But they should check their own ideas against the handbooks and procedures of professional security people who have been exposed to all of the tricks of the trade.

"Unfortunately," claims McDermott, "technical men are often not streetwise to the insidious schemes and actions of the deliberate plotter. The nice thinking engineer or scientist is too apt to assert that the security official sees a bomb-thrower behind every piece of plant equipment."

This attitude sometimes makes it difficult to obtain close cooperation between chemical plant managements and enforcement authorities, the ex-police inspector contends.

If McDermott had his wish every plant executive in the chemical industry (all industry, in fact) would read, absorb and act on the information in a little gray covered book called "Principles of Plant Protection" and published by the Department of Defense. There is an amazing coincidence between the points made in the book (published a few months ago) and the security system in effect at Oak Ridge during the war.

Before espionage activity can be guarded against, say McDermott and the book, it is necessary to know in what kind of information enemy agents are interested. The safest answer here is "everything" . . . but specifically:

1. Capacity, rate of production, order details.
2. Plans and specifications of products.
3. Test records of new items of equipment.
4. Sources of raw materials, components.
5. Destination of products, transportation routes.

6. Data on production methods.
7. Critical points and methods of effective sabotage.
8. Security measures in effect.
9. Dissatisfied labor elements that might be employed.

BIBLE: "The ten commandments of security. . . ."

The methods of getting this information are as varied as the types of information sought, McDermott explains. Infiltration into plants as employees, visitors or inspectors is a favorite means. But an enemy agent can often operate outside the plant by stealing or purchasing information from employees or merely by encouraging them to "talk shop." Another approach involves the use of "fronts" such as commercial concerns, travel agencies, import-export associations, scientific organizations, insurance agencies and business groups to obtain confidential statistical information.

Sabotage, according to the former atomic security official, does not always consist of the "bomb and burn" method. There are many subtler and even more effective devices at the hands of the professional saboteur such as the damaging of power systems, communications and water supplies. And one man working within a plant can cause a lot of havoc by tampering with gauges, precision tools, testing instruments, blueprints, working models or any other thing that is employed to control the quality of the final product. Contamination of raw materials is also a very efficient method to create spoilage and lost man-hours of production.

Protection of life and limb is an equally important job for the security staff, contends McDermott. In times of manpower shortages, lost time injuries due to plant "accidents" can often create more disruption to plant scheduling than contaminated raw materials or spoiled products. The infecting or polluting of drinking water or foodstuffs, tampering with ventilating systems or other safety devices and creation of dangerous working conditions are only a few of the ways a saboteur can knock out the human ingredient in munitions production.

"Yes," concluded the security-wise McDermott, "the saboteur is always thinking up new ways to throw his shoe into the machinery (original derivation of sabotage) . . . Our job is to keep him barefooted."

Socony slaps sabotage: Each company in the Socony family (Socony-Vacuum, General Petroleum and Magnolia Petroleum) will offer heavy rewards to anyone proving a deliberate act of sabotage against the company's operations. Socony, for instance, will pay $25,000 to anyone who voluntarily produces evidence which leads to a conviction for a deliberate act of sabotage against the company when the act results in a permanent disability to an employee or a member of an employee's family.

Spokesmen said the company has taken this position because it feels that sabotage is one of the greatest dangers to national security.

Du Pont: Chambers Works (Deepwater Point, N. J.) is putting through more stringent security regulations, and management is laying the groundwork for tougher ones in the future. The company has clamped down on visitors and unnecessary movement of employees. New photographic squipment will speed up preparation of employee pass cards.

In addition, management sent a letter to supervisors directing them to discuss with their employees the need for keeping alert and reporting suspected violations of plant security.

Shift in Emphasis

"Accentuate the operating side." This was the spirit of the newly modified Board of Directors of Rayonier, Inc. as they packed their things this week to begin a northwestern trek to Hoquiam, Washington, heart of much of their company's operations and scene of the first non-urban board meeting in many a year.

This shunning of skyscraper meeting rooms in favor of a visit to the tall timber and puffing pulp mills has more than surface significance. It reflects the character of the recent shift in the composition and slant of the board . . . toward the operational aspects of their company's role as a major producer of purified wood cellulose.

Before the recent changes (2 directors out, 2 in) the board was about a fifty-fifty blend of men with operating experience and men from the financial world. But the latter group had a somewhat heavier weight due to the fact that Edward Bartsch, then president of the company and board chairman, was a former banker.

Stepped up industrial mobilization among other things made many members of the board feel that a change was needed . . . and in a direction toward emphasis on industrial operations. The situation came to a head early last fall and Bartsch and executive vice-president William Lucey submitted their resignations.

Charles Blyth, a founder of Rayonier and an investment banker (but with an industrial background) became the new chairman. No president

W. REED: New role-call at Rayonier.

was elected, however. But William G. Reed, a West coast lumberman and board member, was named executive vice-president and will function as chief operating officer until a permanent president can be picked. Actually, Reed hopes this choice will be made soon so he can return to his post as president of Seattle's Simpson Logging Company.

Excluding the chairman, the new board consists of 6 industrial men and 4 financial men. This, veteran observers claim represents a good ratio of operating know-how to financial acumen in the directorship of a manufacturing company. Somewhat

more significant is the fact that all six of the industrial men are executive officers of pulp, paper or logging concerns. The two new board members are J. D. Zellerbach, president of Crown-Zellerbach Corporation and Donald S. Leslie vice-president of the Hammermill Paper Company.

The financial contingent of the board is also quite impressive. It lists Carl J. Schmidlapp, executive vice-president of the Chase National Bank; W. A. Parker, president of Incorporated Investors, Morton H. Fry, president of Overseas Securities Corporation and J. B. Lovelace, president of Capital Research and Management Company. All were members of the previous board.

Most significant in the whole change was the fact that it occurred at a time of record profits. It is believed that when totaled the 1950 sales of the company will surpass the previous all time high of $63 million that was rung up in 1948.

Reed, the new executive veep explains this aspect of the situation by saying that in spite of the record sales some members of the board felt that Rayonier was not living up to its potential. "This meant," continues Reed, "that certain policy changes would be necessary . . . and what better time is there to effect policy changes than when business conditions are favorable?"

Uniform Buying

Armed Forces Procurement Regulation is the joint effort of the Defense Department and the Munitions Board to set up uniform procurement standards for the armed forces. Latest section (No. 13, 3 more are in the works) deals with inspection controls and policies.

Section 13 will be important to any one with an eye toward receiving a contract to supply the services. Many manufacturers bear scarred memories from experiences in the last war.

Inspection: The section states that the procuring agency (Army Engineers, Navy Bureau of Ships, etc.) shall be responsible for the inspection. The inspector will be a government one, although not necessarily from the Defense Department.

Inspection will normally be at the source, but could be at other points if it is in the interest of the government. Supplies subject to inspection at the source may be shipped before inspection, but at the risk of the supplier.

The government may accept supplies prior to delivery, at time of delivery, or after delivery, depending on the contract agreements. Supplies which do not meet contract requirements may be accepted under special circumstances, subject to price adjustment later.

One of the highlights of the section is a statement that a minimum of inspection will be required consistent with the monetary or technical value of the product.

NPA In Action

In an 8 page set of rules, the NPA has established formalized procedures for consulting with industry on defense production. The rules put on paper what had been standing operating procedure for NPA since its inception. Officials explain the move was necessary to protect participating industries. Big business feared that if an advisory committee decided to allocate scarce materials—even under NPA sponsorship—affected consumers might seek anti-trust action.

Justice Department gives its blessings to the arrangement but the Attorney General has laid down certain requirements. Committees will serve in an advisory capacity only. They will discuss problems relating to the defense effort and the industry involved; they will furnish advice and information. But they will not determine policy or have authority to coerce anyone into complying with NPA regulations.

Agendas for meetings will be formulated by government and all meetings will be conducted under the chairmanship of a full time government official. Furthermore, minutes must be kept on every meeting.

Committees will be appointed by directors of NPA's industry divisions. They will be designed to give representation to small, medium, and big business.

Already set up and functioning are advisory committees for sulfur, barium carbonate, industrial alcohol, pigments, alkali-chlorine, benzene, pesticides, and glycerine.

Important cog in the wheel will be G. Lyle Belsley. He'll head up a separate office of Industry Advisory Committee, which will issue invitations to committee meetings and coordinate activities. Belsley has a good background for the job—he's a career administrator and has been in and out of the government since 1940. He has held key posts with WPB, CPA, NSRB, and other agencies.

New amendment to NPA's M-4 restriction on expansion programs won't affect new construction in the chemical industry. Feb. 15 is the day restriction goes into effect. After that day construction or alteration of any building will require a license. And obtaining a license may prove to be a good trick . . . if it can be done.

The restriction gives further evidence that the "do-it-now" boys are at the helm. J. W. Follin, who wanted to wait until April 1 before licensing, resigned as chief of NPA's construction controls division to take up his old job as assistant to Jess Larson in GSA.

NPA claims that restriction will make more material available for defense construction. Military planners don't go along with that altogether, though. They see only about 2 billion dollars worth of construction for the next year. That figure doesn't compare with the building boom during 1941-2. Big reason is "mothball" army camps and shipyards. Air Force has enough good bases, but a few will have to be built and some runways expanded to take care of the bigger planes.

The tightened restrictions came as no surprise to Washington circles. Insiders there look for tighter controls in the near future.

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OREGON STATE CAPITOL: Clean building scene of debate on dirty subject.

Clean Air Crux

An air pollution control bill loomed on the docket of Oregon's state legislature when it convened this month. And the surprising thing is that, unlike most anti-pollution legislation . . . this bill has teeth. It gives the Sanitary Commission of the state adequate power to enforce the law and asks for an immediate appropriation of $100,000 to set up the enforcement.

The bill is not in the hands of the committees yet, but the measure has the support of the governor, a good omen for any embryonic law. Insiders look for an early passage with possible changes in the bill as proposed.

Under its terms, the Sanitary Authority would be in charge of all matters relating to air pollution. The bill defines air pollution as any discharge of contaminants into the air in a concentration that might prove harmful to any form of life or in a concentration that would constitute a public nuisance.

Membership in the Sanitary Authority would be increased by three . . . the state Director of Agriculture would be one member and the governor would make the two additional appointments. But one appointee would represent industrial manufacturers while the other would be an agent for municipalities.

Cooperation: Under the legislation, the Sanitary Authority would develop a comprehensive program for air pollution control. It would also work in cooperation with other agencies, inside and outside the state, who are also concerned with the problem.

Inspection: The Sanitary Authority would have the license to examine and approve or disapprove plans and specifications for all equipment and processes capable of emitting air pollutants. It would be empowered to enter and inspect all property with the single exception of private dwellings housing four families or less.

Violation: Under the terms of the bill, the Sanitary Authority could issue orders to violators to correct the situation or appear before the Authority for a hearing. If evidence produced at the hearing supports the violation accusation, the Authority could then issue any orders it deemed necessary to remedy the situation. All such orders would be final and binding unless an appeal is made to the Supreme Court of the state. But in the case of an emergency, the Authority could issue orders that would become effective immediately.

Taxpayers: The bill asked for an appropriation of approximately $110,000 from the state treasury . . . and not earmarked for any other purposes. If the bill goes through, the "free air" breathed by Oregon's taxpayers may be expensive . . . but it will be clean.

For Rent

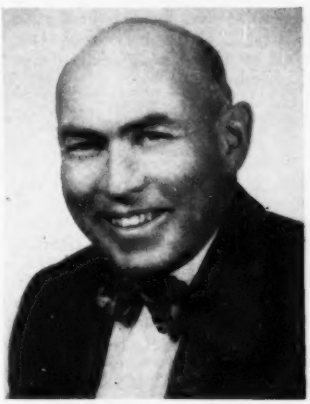
Raw material shortages and expanded facilities make an unhappy combination for firms engaged in non-essential production. But Synthron Inc. (Ashton, R. I.) has an answer . . . subcontracting to essential producers.

This week, Robert Zametkin, treasurer and operating head of the firm, is getting a lot of mail. Most of it consists of responses to his recent letter sent to major chemical firms in which he said, "We have productive capacity which we could use to produce some of your goods." The proposition was as simple as that.

Zametkin emphasizes the point that Synthron is not in distress. Present business is good and though the raw material situation is tight, the company has been able to meet all the current demands of its customers. But an expansion program has left Synthron with additional capacity. And, in case of a full-scale shooting war or a period of controls on raw materials, Zametkin would like to see the company in a position where it could contribute a share to the total effort and, incidentally, stay in business.

The expansion program was undertaken in anticipation of normal business growth—long before talk of hostilities in Korea. The expanded facilities consist of a new Hastelloy C 1000 gal. jacketed reactor, glass lined equipment, and increased boiler capacity to take care of the extra load. Installation will be completed this week.

The plant's present capacity is estimated to be 10 million pounds a year, working on a single product and operating 12 hours a day. Firm's engineers say that they are now operating close to that figure. New Equipment will double capacity and will enable Synthron to handle special chlorinations, sulfonations, esterifications, polymerizations, and other organic reactions of a corrosive nature.



R. ZAMETKIN: "If Ford can do it, so can we."

Zametkin organized Synthron in 1946—another time of raw material shortages. He started with a rented

building that had been used as a commercial garage, installed a half dozen production and compounding units and set up a laboratory for research and control. The firm caught on (Zametkin calls it New England's fastest growing chemical company) and now turns out a variety of items for the textile industry. Principal products are urea-formaldehyde resins, wetting agents, detergents and soaps, and water repellents.

Zametkin's idea of subcontracting is worthy of note to other concerns in similar straits. The practice is not restricted to small companies as Zametkin points out in his letter . . ."We feel strongly that if Ford Motor Company can make airplane engines to relieve the pressure on Pratt and Whitney, Synthron can compound chemicals under the same system."

Echo: Harry Echler, vice president of General Electric spoke on subcontracting before a meeting of the American Management Association. He said, "The teamwork and cooperation between subcontractors and prime contractors in World War 11 made possible the production miracles that are history today."

Echler added another angle that would be of importance in the event of another war. Subcontracting affords a means of spreading war production on a broad geographical basis. That would mean less vulnerability in case of a bombing attack.

FOREIGN

England: The British plastics industry is becoming alarmed over raw material supplies. With typical restraint, an official of the British Plastics Federation describes the situation as "difficult".

Because the plastic industry is so dependent on other industries it is difficult to get an accurate picture. For instance, if metal shortages cause motor vehicle production to fall, there will be a corresponding drop in demands for plastic components. A shortage one week could mean a surplus next week.

As of now, though, some things stand out plainly. Britain is in short supply of cellulose acetate—made from cotton linters. The world shortage on cotton is the principal cause, but increased use of synthetic fibers means that more of the available supply of linters is being channeled for producing rayon.

There is an acute shortage of phenol, but urea does not present any problem. Production of polystyrene is not nearly enough to supply Britain's needs—it must rely on imports from the U. S. The race here for that material between plastics industry and synthetic rubber makers will mean less for England.

As yet there is no plan of rationing or allocation. One customer can produce plastics for strategic materials and at the same time turn out plastics for dishes.

France: The plastics industry in this country is also feeling the raw material pinch. Shortages have caused hoarding and prices have skyrocketed. Polystyrene—imported from the U. S. —has advanced 30% in the last two months: Fabricators hope that the high price (600 franc per kg.) will induce hoarders to place substantial stocks on the market. Polyethylene, also imported from the U. S., is in tight supply.

On the other hand, production of phenol has been hopeful. Production has doubled the 1938 output of 6,000 metric tons and the goal of 20,000 tons will be achieved by 1952. Output of phthalic anhydride has been four times that of prewar.

Methanol production has doubled since the war, but the market is characterized by high prices. Principal reasons for high cost are shortage of electric power, high price of coke, and taxes.

PEOPLE

Edwin S. Ladley was named assistant director of purchasing for Hercules Powder. He succeeds William L. Hewes who retired in December. Ladley had been buyer for the purchasing department.

Robertson B. Clark joined executive sales staff of Mallinckrodt Chemical Works. He had been president of the Clark Drug Company in Arizona.

J. F. Pritchard is the new president of National Construction Association, an organization of engineers and builders of chemical plants, steel mills, and petroleum refineries.

Paul J. La Marche, formerly sales manager for National Distillers Chem. Corp. was made general manager of the company.

William H. Stewart was appointed purchasing agent for General Analine Works Division.

A. L. Geisinger has been appointed a vice president for Diamond Alkali Co. In his new post, he'll have charge of the company's activities in the organic chemical field. Geisinger is also president of Martin Dennis Co. (subsidiary of Diamond Alkali).

EXPANSION

Merck: In order to establish manufacturing facilities on the west coast Merck has purchased Marine Magnesium Products Corp. Merck had been considering such a move for many years, and decided on San Francisco as most promising spot.

Marine is an established firm, and makes a number of products used in the fine chemical, pharmaceutical, and other industries. Under the arrangement, Marine will function as a division of Merck, and its president and founder, Robert E. Clarke, will continue to head operations.

The deal (an exchange for 35,000 shares of Merck common stocks) will be submitted to Marine stockholders at the Feb. 7 meeting.

Magnesium plants: As directed by the Munitions Board, 2 more government owned magnesium plants are to be reopened to produce this vital metal for national stockpile. The 2 plants are at Velasco, Texas, and Monteco, California.

Dow operated plant in Velasco will be in production in May. Production will be 160 million pounds in the next two years. The Kaiser Magnesium operated plant in Monteco will start production in July. The goal there is 40 million pounds in 2 years.

The 2 plants make a total of 5 that the government has ordered reopened. Their combined production will amount to 312 million pounds in the next 2 years. Under present plans, entire output will be stockpiled.

Sinclair Refining: The company will spend $50 million on expansion program. The company is clearing 640 acre plot adjacent to its plant at Pasadena, Texas, and will spend $25 million for new facilities. The other $25 million will be used to modernize present plant.

General Mills: New plant will mark company's entry into the fatty amine industry. Plant will be constructed at site of present plant in Kanakee, Ill., and will be in pilot production by fall of this year

Solvay Process Div: Application for necessity certificate was filed to expand soda ash production. Program would add 200 tons a year to production of plant at Baton Rouge.

BOOKS . . . . . .

Technique of Organic Chemistry, Vol. III by Arnold Weissberger, Interscience Publishers, Inc., New York; ix+661 pp., $10.00.

This third member of the series that is devoted to the presentation of the instrumental techniques used in the organic laboratory and those available for the investigation of organic compounds treats the methods and unit operations used in preparative organic chemistry. Each chapter, written by an authority on the subject, is designed to aid research men in the actual selection and effective application of the numerous physical methods that are utilized in organic chemistry. The authors describe the various techniques and tools, their modifications, their merits and limitations, and their handling in addition to their theoretical background. The eight topics covered in this volume are heating and cooling, mixing, centrifuging, extraction and distribution, dialysis and electrodialysis, crystallization and recrystallization, filtration and solvent removal, evaporation and drying.

Chemical Engineering Costs by O. T. Zimmerman and Irvin Lavine. Industrial Research Service, Dover, N.H.; ix+419 pp., $7.00.

On the premise that economics is and must be the guide to engineering practice, this book offers correlated cost data of importance to the chemical engineer. A staff of specialists in the field of equipment manufacture author the individual chapters, each dealing in his own product line. In the first chapter, however, the two main authors outline the factors involved in chemical engineering and the methods for estimating these costs. Equipment covered in this volume include such items as heat exchangers, evaporators, rotary and spray dryers, crystallizers, fractionating towers, centrifuges, fans, centrifugal pumps, reciprocating compressors, and steam-jet ejectors. Additional information is given on such industrial materials as pipe, valves, insulation, structural steel, sheet metal, etc. Multiple illustrations, cost charts, and tables pertinent to the subjects discussed also appear.

Natural Gas and Natural Gasoline by R. L. Huntington. McGraw-Hill Book Co., New York; vii+598 pp., $8.00.

Designed primarily as a text for engineering students taking courses dealing with the production of natural gas from crude-oil, condensate, and dry-gas fields, and the manufacture of liquefied products from this raw material, this book outlines the natural gas and natural gasoline branches of the petroleum industry. The author stresses the practical approach and utilizes the case method to clarify the meaning of laws underlying various operations. A few fundamental principles are shown to be applicable to the solution of many practical problems involving the design and operation of gas gathering and natural gasoline recovery systems.

This volume also discusses recent advances in gas condensate cycling, oil absorption, fractionation, gas dehydration, etc. Since the author offers practical knowledge, this text will be of interest to the process and equipment designer.

The AMA Handbook of Wage and Salary Administration, edited by M. Joseph Dooher and Vivienne Marquis. American Management Association, New York; 412 pp., $7.50.

At the opportune moment when companies are already reviewing their wage programs in anticipation of wage control, the AMA offers a manual setting forth the basic principles and techniques of wage and salary administration. The handbook presents management's experiences with all major types of job evaluation and wage administration plans, together with case accounts of their use and adaptations to meet special problems in large and small companies. Also included are job evaluation forms, new AMA research material on wage surveys, union contract provisions covering office salary administration, and bibliography.

Briefly Listed

A. S. T. M. STANDARD ON PETROLEUM PRODUCTS AND LUBRICANTS, latest edition brings together in compact form most of the A. S. T. M. standards, test methods, and specifications widely used in this field. Available from the American Society for Testing Materials, 1916 Race St., Philadelphia 3, Pa. for $5.50.

MANUAL OF ANALYTICAL METHODS FOR THE DETERMINATION OF URANIUM AND THORIUM IN THEIR ORES prepared by the technical staff of the AEC's Analytical Laboratory at New Brunswick, N.J., it is a technical booklet describing the analytical procedures for determining the uranium and thorium content of ores. Available from the Superintendent of Documents, U. S. Government Printing Office, Washington 25. D.C. for 20¢ a copy.

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8-p. booklet containing general instructions and technical data on Rezolin "8000" Tool-Plastic, a thermosetting liquid phenolic plastic material developed specifically for tool and model applications. Liberal use is made of illustrations, diagrams, and tables. Rezolin, Inc.

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24-p. technical manual surveying general topic of driers for oils and resins including both the theoretical and practical aspects of drying, drier recommendations for oils, oleoresinous varnishes, and alkyd resins and a bibliography on driers and the mechanism of drying. Nuodex Products Co., Inc.

Hydrogen Peroxide

Data sheet giving details on the uses of hydrogen peroxide in the purification of process solutions containing metal salts and supplying directions for isolating metal salts from various process solutions. The Buffalo Electro-Chemical Co., Inc.

Glutathione

Technical bulletin listing the physical and chemical properties of this tripeptide and surveying its applications in biochemistry and medicine. Schwarz Laboratories, Inc.

Equipment

Chemical Feeder

8-p. bulletin featuring midget belt gravimetric feeder, a small weighing feeder for dry materials, and containing thorough explanations of its component parts and operation. Omega Machine Co.

Mercury Plunger Relays

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Water Heater

Illustrated bulletin describing junior feed water heater for preheating feed water supply in small power plants of 300 hp or less. The Swartwout Co.

Valves

8-p. bulletin covering cross section of firm's entire line of automatic pressure relief and pressure reducing valves and those used as controls for hot water heating systems. A. W. Cash Valve Manufacturing Corp.

Belts

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12-p. bulletin describing the "V/A" cell kinetic manometer as a compact flow indicator and transmitter unit; it is a differential pressure instrument without need for mercury, bellows, seals, condensate chambers or manifold systems. Included are diagrams of the component parts and also of typical installations. Fischer & Porter Co.

Compressors

Illustrated booklet noting special features, specifications, and dimensions of gas-engine driven compressors, sizes 330 and 440 horsepower. Ingersoll-Rand.

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4-p. technical data card offering a revised edition of combined standard steel lists of AISI and SAE. The Babcock & Wilcox Tube Co.

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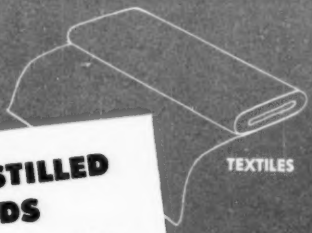

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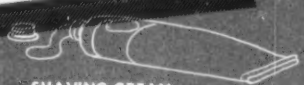

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